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THE SOUTH AFRICAN SPECIES OF AIZOACEAE.

III. *GALENIA* L.

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The genus *Galenia* is confined to southern Africa where it is especially characteristic of the drier regions of the west and south-west. It is absent from the main summer-rainfall areas. The genus is a distinctive one characterised by exstipulate leaves, small flowers, a superior ovary with a single pendulous ovule in each carpel, and stamens twice as many as the segments of the perianth and arranged in pairs alternating with the perianth lobes. Along with the endemic South African genus *Plinthus* which has isomerous stamens, it constitutes a group in the tribe *Aizoineae*.

The genus was founded by Linnaeus in 1753 for the species *G. africana*. Shortly afterwards his son added a second species. The connotation of the genus was extended by Fenzl in 1839 when he merged *Kolleria* Presl. with it. In 1843 Walpers also combined *Sialodes* E. and Z. It was further enlarged in 1862 when Fenzl transferred to it a number of species previously assigned to *Aizoon*. The only comprehensive account of the species is that by Sonder, Fl. Cap. 2. 473 1862, which was largely based upon the work of Fenzl. In it Sonder recognised 18 species. Since that time a number of additional species have been described, especially from Namaqualand and S.W. Africa, but no general account has been undertaken. In collections there has been some confusion in the identification of specimens. In the present account not all the described species have been upheld, some are reduced to varietal rank, some to synonymy. In all 27 species are recognised of which 6 are described for the first time. Several new varieties are also described.

In the course of this revision, in addition to fresh specimens, material in the following collections has been examined:—

Bolus Herbarium, Cape Town.. ..	BOL
University of Cape Town	CT
South African Museum, Cape Town	SAM
National Bot. Gardens, Kirstenbosch	NBG
National Herbarium, Pretoria.. ..	PRE
Albany Museum, Grahamstown	GRA
Royal Bot. Gardens, Kew	K
British Museum (Nat. Hist.) London	BM
Botany School, Cambridge	CGE
Naturhist. Riksmuseum, Stockholm	S

The specimens in the Linnean herbarium, London have also been examined. To the curators and staff of these institutions, thanks are returned for facilities for examination of the specimens.

GALENIA

L. Sp. Pl. 359. 1753. Gen. Pl. ed. 5. 169. 1754.

Kolleria Presl Symb. Bot. 2. 24. t14. 1832.

Sialodes Eck. & Zeyh. Enum. 329. 1837.

Shrublets, less often herbaceous. Leaves opposite or alternate, simple, usually small, exstipulate. Flowers small, in cymes, each with a bract and two bracteoles: bracts and bracteoles often adnate to the perianth. Perianth segments 4 or 5, rarely 3, united at the base, the lobes coloured inside. Stamens twice as many as the perianth segments, in pairs alternating with the segments: anthers versatile. Ovary superior, carpels 2, 3, 4 or 5, each with 1 pendulous ovule: styles free, as many as the carpels: stigma all along the inner side of the style. Fruit dry, leathery, splitting at the top. Seeds compressed or flattened, reniform or orbicular.

The type species is *G. africana* L.

Perennials, most commonly with shoots that die back to the base in the dry season. Erect, or more commonly diffuse with secund branches. In most species there is variation in leaf size, the lower larger; several produce unusually large leaves at the beginning of the growing season. The larger leaves often drop in the later stages. In many species the leaves have enlarged water-storage cells in the epidermis. In the fresh state these project as glistening papillae, in dried material they appear as rounded or polygonal depressions on the surface. The flowers are small, either sessile or nearly so. While the structure of the flower is very uniform, the form of the inflorescence and the size of the flower are characteristic for the species. The flowers are protandrous though the stigmas ripen before the shedding of pollen is complete. The stamens ripen in

succession, the filament elongates to 3 times its length at dehiscence. One of each pair elongates at a time.

Most abundant in the drier regions in the west and south-west, especially along the margins of the Karoo. Also occurring on the southern coastal belt. All are lowland plants, none are found on the higher mountains.

Fenzl (Ann. Wien. Mus. 2. 288. 1839) was the first to divide the genus into subgenera. He recognised two:—(1) *Eugalenia* perianth 4: styles 2: fruit tardily dehiscent; and (2) *Kolleria* perianth 4 or 5: styles 3, 4 or 5: fruit dehiscent. His scheme has been generally followed by later authors (e.g. Sonder Fl. Cap. 2. 474. 1862; Pax in Engl. & Prantl Nat. Pflanzf. 3.1.b. 43. 1889; Della Torre & Harms Gen. Siphonog. 1. 154. 1904; Pax & Hoffmann in Engl. & Prantl Nat. Pflanzf. ed.2. 16.c. 224–5. 1934). However, an examination of a number of specimens has thrown doubt upon whether this division is a natural one. There are included in the subgenus *Eugalenia* a number of species which in appearance, habit and general structure are so much like species in the subgenus *Kolleria* that subgeneric separation on the number of styles seems unnatural. Several of these species have either 4 or 5 perianth segments, and in a few there are examples with 3 styles. It is to be noted that several of these species were originally ascribed to *Aizoon* and transferred by Fenzl.

In addition to the species referred to, there is in the subgenus *Eugalenia* a distinctive group of species characterised by opposite narrow leaves, symmetrical inflorescences, 4 perianth segments and two carpels. The species in this group are summer-flowering, Dec.—Feb., whereas all the others flower earlier, Aug.—Oct. It is proposed to separate this group as a subgenus. As it contains the type species it will carry the name *Galenia*. As so separated the subgenus has the same connotation as the original genus.

All the other species, which are characterised by secund branches at least in the inflorescence and most commonly by obovate leaves, are placed in the subgenus, *Kolleria* with an enlarged connotation. This subdivision groups the species into easily distinguishable groups which are based on habit, leaf-form and arrangement, inflorescence and flower structure. The two subgenera are defined as:—

Subgen. 1. *Galenia*.

Eugalenia Fenzl Ann. Wien. Mus. 2. 288. 1839. p. pte.

Erect or suberect shrublets. Leaves opposite, linear or linear-oblong, usually glabrous or nearly so. Flowers in terminal cymes, usually paniculate, not secund. Perianth segments 4, in two dissimilar pairs, membranous at the edges and tips. Styles 2, ovary flattened. Fruit not or tardily dehiscent. Plants green or yellow, not gray or white.

The type species is *G. africana* L.

Subgen. 2. *Kolleria* Fenzl l.c. *emend.*

Presl Symb. Bot. 2. 24. t.14. 1832. *pro gen.*

Prostrate or diffuse shrublets. Leaves usually secund, opposite or alternate, most commonly obovate or spatulate, very often gray or white. Flowers in secund cymose inflorescences. Perianth segments 4 or 5, usually alike. Styles 2, 3, 4 or 5. Fruit dehiscent.

The type species is *G. herniariaefolia* (Presl) Fenzl.

Subgen. 1. *Galenia*.

KEY TO THE SPECIES.

- | | |
|---|--|
| 1. Stems densely covered with stout spreading hairs. | 2. <i>hispidissima</i> |
| 1. Stems glabrous or with short appressed hairs. | |
| 2. Leaves subulate, connate at the base: perianth segments with a stout mucronate tip | 6. <i>Ecklonis</i> |
| 2. Leaves not subulate, not connate, perianth without a mucronate point. | |
| 3. Stem with internodes as long as the leaves: leaves at least 2 cm. long. | |
| 4. Leaves soft, drooping when dry, soon deciduous. | |
| 5. Leaves linear or linear-lanceolate: flowers yellow-green, 1—1.5 mm. long. | |
| 6. Leaves flat, often over 2 cm. long: inflorescence a spreading panicle | 1. <i>africana</i> |
| 6. Leaves filiform: inflorescence with long secund branches | 1. <i>africana</i> var. <i>secundata</i> |
| 5. Leaves oblong or obovate: flowers 1.5—2 mm. long | 1. <i>africana</i> var. <i>pentandra</i> |
| 4. Leaves rigid, distant, less than 2.5 cm. long: flowers white, in a flat-topped umbel | 3. <i>rigida</i> |
| 3. Stems with internodes not longer than the leaves: leaves squarrose, less than 2 cm. long. | |
| 7. Leaves up to 2 cm. long, usually widened to the tip: inflorescences many-flowered, exposed: ovary not indented at the top | 4. <i>namaensis</i> |
| 7. Leaves rarely up to 1 cm. long, not widened to the tip: inflorescences few-flowered, surrounded by leafy branches: ovary indented at the top | 5. <i>procumbens</i> |

1. *G. africana* L. Sp. Pl. 359. 1753.

G. linearis Thunb. Prod. Pl. Cap. 77. 1794.

An erect aromatic green or yellow-green softly woody shrublet, 0.5—1.5 m. high. Stems pale-coloured, glabrous except for very short appressed hairs on the youngest parts. Leaves opposite, bright green but the older yellow or orange, soft, drooping when dry, flat, linear, narrowly oblong or very narrowly spatulate, 1.5—5 cm. long, 0.2—0.5 cm. wide, acute, the upper shorter. Inflorescence a terminal panicle, pyramidal, corymbose or almost umbellate, 3—10 cm. long, 2—12 cm. wide: flowers numerous, yellow-green. Bracts at the base of the inflorescence leaf-like,

in the distal parts very small. Bracteoles not longer than the flowers. Perianth segments 4, 1—1.5 mm. long, the outer cucullate at the tip, the inner flatter, with a cylindrical mucronate point, generally sickle-shaped or bent back. Anthers yellow or orange, less often red. Styles thick.

The type is in herb. Linn. (507: 1.)

Common especially at the western and southern margins of the Karoo. Not eaten by stock and spreading extensively in overgrazed or disturbed vegetation, also along roadsides. Certainly much more abundant and widespread than in the past.

Very variable in size, amount of branching, and in colour. Occasionally covered all over with short hairs. Easily recognised by the long soft leaves and many-flowered inflorescences with small yellow-green flowers. The inflorescences may be solitary or several together and vary much in shape and density. At the base they are forked but often appear to be trichotomous, one division appearing as a lateral branch. The ultimate branches are usually divaricate.

S.W. AFRICA. Windhoek *Liebenberg* 4479 (PRE); Fish Riv. *Marloth* 3734 (PRE); Sjambok Riv. *Pillans* 6464 (BOL. K.); Holsog *Marloth* 8984 (PRE); Scharfenstein *Pearson* 8575 (BOL. K.); Schackalskuppe *Pearson* 4799 (K); Zoutpansdrift *Pearson* 5013 (GRA. K); Kl. Karasberg *Galpin* 14129 (BOL. K.).

NAMAQUALAND. Steinkopf *Schlechter* 31 (BOL, GRA, PRE), s.n. (BM, K); Okiep *Pillans* 4952 (BOL); Horeas Riv. *Pillans* (BOL); Wallekraal *Pillans* (BOL); Garies *Henrici* 2158 (PRE).

CALVINIA. Loeriesfontein *Acocks* 15209 (PRE); Nieuwoudtville *Theiler* 89 (PRE); Calvinia *Theron* 1622 (PRE); Botter Kloof *Adamson* 5235—6; Blaaukrantz Pass *Adamson* 4552.

KENHARDT. Brandvlei *Esterhuysen* 4001 (BOL, PRE); *Tyson* 4001 (NBG); Kenhardt *Adamson* 2033.

VAN RHYNSDORP. Van Rhynsdorp *Thode* A1895 (K, PRE).

CLANWILLIAM. Blaauberg *Pillans* (BOL); Clanwilliam *Henrici* 3295 (PRE); *Leipoldt* 912 (BOL); *Rogers* 16803 (BM); Greys Pass *Pearson* 5146 (BM, K); Warm Baths *Stephens* 7260 (K).

CERES. Leeuwfontein *Pearson* 3244 (BM, GRA); Karroo Poort *Adamson* 4728; *Pearson* 4814 (BM); Hottentots Kloof *Pearson* 4814 (BM, K).

SUTHERLAND. Middelpost *Adamson* 5244—5, 5247; Roggeveld *Worsdell* (K); Verlaten Kloof *Adamson* 5239.

LAINGSBURG. Rd. to Sutherland *Pole Evans* 19107H (PRE); Matjesfontein *Galpin* 4075 (GRA); *Foley* 4 (PRE); *Marloth* 702 (PRE); Whitehill *Compton* 12604 (NBG).

- PRINCE ALBERT. Prince Albert *Stokoe* 9323 (BOL), s.n. (SAM).
 WORCESTER. Touws Riv. *O. Kuntze* (K): Hex Riv. "R.L.D." (PRE): *Rehmann* 2469 (BM, K): *Tyson* 763 (GRA, SAM): Worcester *Bolus* 5055 (BM, BOL): s.n. (BM): *Ecklon & Zeyher* (GRA, PRE).
 TULBAGH. Tulbagh *Pappe* (GRA).
 PAARL. Paarlberg *Drege* (S).
 STELLENBOSCH. Hottentots Holland *Ecklon & Zeyher* (86) (S): *Zeyher* (S): Somerset West *Parker* 3630 (BOL, K, NBG).
 CAPE. Blaauwberg *Pillans* (BOL): Milnerton *Adamson* 2691 (CT): Koeberg *Pappe* (K): *Zeyher* (SAM): Cape Flats *Rehmann* 2010 (BM): Salt Riv. *Schlechter* 285 (BM, BOL, CGE, GRA), s.n. (PRE): Rosebank *Page* (CT): *Pillans* 3278 (BOL, PRE).
 CALEDON. Sonderende *Schlechter* 5632 (BM, GRA, K, PRE).
 BREDASDORP. Elim *Zeyher* (S).
 ROBERTSON. Robertson *Britten* 647 (GRA).
 MONTAGU. Koo *Barnard* 774 (SAM): Montagu *Ecklon & Zeyher* 309 (S): *Page* 115 (PRE): Kogmans Kloof *O. Kuntze* (K).
 SWELLENDAAM. Swellendam *Bowie* (K): *Bolus* (BOL): Breede Riv. *Zeyher* 2638 (S, SAM).
 RIVERSDALE. Garcias Pass *Adamson* 5146—8: Muiskraal *Galpin* 4074 (GRA): Albertinia *Muir* 597 (PRE).
 MOSSEL BAY. Herbertsdale *Burchell* 6414 (K): Mossel Bay *Moss* 6815 (BM).
 GEORGE. George *Bolus* (GRA): Olifants Riv. *Bolus* 2313 (SAM), 2315 (BOL, K, SAM): Montagu Pass *de Castelnau* 65 (PRE).
 UNIONDALE. Georgida v. *Rensburg* S1062 (PRE): Uniondale *Fourcade* 4286 (BOL, K).
 WILLOWMORE. Willowmore v. *Z. Bakker* 237 (PRE).
 ALBANY. Grahamstown *Foley* 1657 (K).
 Without locality:—*Alexander* (PRE): *Drege* (BM, K): *Ecklon* (S): *Forsyth* (K): *Forster* (K): "Hort. Chelsea" (BM): *Sieber* 65 (S), "Swartland" (SAM): *Talbot* (K): *Thunberg* (BM): *Verreaux* (B) *Wallich* (CGE, K): *Zeyher* (K, SAM).
 A specimen without collector's name is marked "St. Helena" (CGE). For hybrids see under *G. namaensis* and *G. procumbens*.

Var. **secundata** Adamson var. nov.

A typo differt foliis angustissimis filiformibus, inflorescentia secunda ramis alternis secundis subdivaricatis, floribus minoribus, staminibus saepe 4—5 vel 4—6 solum perfectis.

More slender and less erect. Stems not over 45 cm. high, white. Leaves very narrow, linear-filiform, soft, slightly glaucous. Inflorescence secund,

with few main branches but many short alternate divaricate lateral branchlets. Flowers about 1 mm. long. Inner perianth segments with an incurved flap at least half their length. Stamens 8, 6 or 4, commonly 4 complete and 2—4 with very small anthers.

The type is *Bryant* 115 (K).

S.W. AFRICA. Luderitz *Kinges* 2462 (PRE); Kl. Karasberg *Galpin* 14129 (BOL, K, PRE).

KENHARDT. Kakamas *Wasserfall* 1143 (PRE).

PRIESKA. Prieska *Bryant* 115 (K), J115 (PRE); *Pole Evans* 2334 (K).

VICTORIA WEST. Victoria West *Reynolds* 4186 (PRE).

Var. **pentandra** Hiern Welw. Cat. Afr. Pl. 1.2. 411. 1898.

Sprawling, rarely over 40 cm. high, and more woody. Branches often divaricate. Leaves oblong or obovate, 1.3—2.5 cm. long, 0.4—0.8 cm. wide, hooked or falcate at the tip, narrowed to a petiole at the base. Inflorescence corymbose with rather stout branches. Flowers 1.5—2 mm. long. Bracts and bracteoles adnate to the perianth and often shorter. Perianth segments 4, the inner bent inwards at the tips. Styles occasionally 3, about as long as the perianth.

The type is *Welwitsch* 1093 (BM).

Originally described as having 5-merous flowers with 5 stamens but an examination of the type material does not confirm this. It is possible that the bract or bracteoles may have been mistaken for part of the perianth, and in older flowers some of the stamens fall off and an appearance of isomery results.

This variety seems to agree with the meagre description of var. *halimifolia* Sond. Fl. Cap. 2. 478. 1862 but the only specimen so named in Sonder's herbarium, *Drege G. africana* L.a, consists of two parts, a bunch of leaves that agree with the description, and a flowering shoot which is typical *G. africana*.

Var. *pentandra* was first recognised by Oliver Fl. Trop. Afr. 2. 585. 1871 but was not named by him.

ANGOLA. Mossamedes *Welwitsch* 1092 (BM), 1093 (BM, K).

NAMAQUALAND. Vogelklip *Schlechter* 11301 (BM, K, PRE).

2. **G. hispidissima** Fenzl in Sond. Fl. Cap. 2. 478. 1862.

A low-growing many-stemmed plant up to 15 cm. high, in bunches. Stems decumbent, woody at the base only, rather thick, the younger densely covered with stout yellow or white bristle-like hairs 1—2 mm. long, standing out at right angles. Leaves opposite, linear, flat, 0.7—2.5 cm. long, green, narrowed to the base, acute at the tip, with scattered bristle hairs on the edges and underside. Flowers in a crowded panicle. Bracts like the leaves but much shorter, those on the ultimate branches

shorter than the flowers. Perianth segments 4, 2—3 mm. long, acute, with some bristle-hairs outside. Anthers orange or red. Styles 2, short.

The type is *Drege* 7055.

Sandy soils among bushes on the lowest mountain slopes.

CLANWILLIAM. Warm Baths *Pearson* 7172 (SAM); *Stephens* 7172 (GRA, K, SAM).

PIKETBERG. Piketberg *Bolus* 7545 (BM, BOL, GRA, K, NBG, PRE); *Edwards* (BOL): 170 (BOL); *Guthrie* 2607 (NBG).

CERES. Gydouw *Leipoldt* 4012 (BOL).

Without locality—*Drege* (S).

3. *G. rigida* Adamson sp. nov.

Fruticosa glabra ramosa, ramis floriferis erectis eramulosis. Folia subrigida lineari-oblonga erecto-patentia superiores internodiis breviora inflorescentia umbellatocorymbosa compacta. Bracteae superiores reflexae.

An erect rigid branching shrublet up to 50 cm. high, often yellowish. Stems pale, covered with wax, sometimes sticky. Leaves rigid, linear-oblong 1—1.25 cm. long, 0.2—0.3 cm. wide, flat or more usually concave above, ascending, glabrous and often sticky, the upper shorter than the internodes. Inflorescence terminal, cymose-umbellate, flat-topped, rather compact, on an erect unbranched shoot 5—20 cm. long. Bracts smaller than the leaves, the lower reflexed, all but the ultimate longer than the flowers. Bracteoles very small. Perianth segments 1.5—2 mm. long, white inside, distinctly connate, the outer flattish, cucullate at the tip, the inner with the acute or acuminate membranous tip sharply bent inwards.

The type is *Adamson* 5240 (BOL).

Rocky places especially on dolerite in the N.-W. Karoo.

CLANWILLIAM. Olifants Riv. *Rodin* 5051 (BOL, K, PRE).

SUTHERLAND. Btn. Sutherland & Middelpost *Adamson* 5240—1, 5243, 5246.

4. *G. namaensis* Schinz Bull. Herb. Boiss. 5. App.3. 76. 1897.

Shrubby, erect, diffuse, or occasionally sprawling, up to 60 cm. high. The young parts covered with short closely appressed hairs, the older glabrescent. Leaves dull green or glaucous, yellow when old. Branches white, ascending or divaricate. Leaves usually crowded, rather rigid, linear but more or less widened towards the tip, 0.3—2 cm. long, most commonly 0.5—1.5 cm., about 2 mm. wide, folded upwards, most often falcate with the tip hooked. Inflorescences exposed, terminal on the main shoot and branches, usually numerous, varying from laxly cymose to compact, umber-like or almost hemispherical, 2—3 cm., rarely up to

5 cm. across. Bracts like small leaves, the upper very small: bracteoles thick, concave above, about as long as the flowers. Perianth segments about 2 mm. long, white or greenish inside, the outer cucullate, the inner with a shortly mucronate tip. Anthers yellow, orange or less often pink. Ovary flat, not indented at the top. Seeds black, reniform.

The type is *Fenchal* 171 (Z).

Rocky places, especially in dry river beds, at the north and west margins of the Karroo.

Rather variable in the length and closeness of the leaves and in the number and density of the inflorescences. The species has been much confused with *G. africana* and *G. procumbens*. From the former it is distinguished by the shorter more rigid leaves, the small inflorescences largely on lateral branches, and the white flowers. From the latter by the longer and more clavate leaves, the more compact and exposed inflorescences, and by the ovary not indented at the top.

S.W. AFRICA. Rehoboth *Rodin* 2781 (BOL, PRE, K); Swakop Riv. *Moss* 17938 (BM); Windhoek *Codd* 5809 (PRE); *Steyn* 8964 (PRE); Walfish Bay *Rodin* 2139 (BOL, K, PRE); Nomtsas *Pearson* 9327 (BOL, K); Rossing *Pole Evans* 19334H (PRE); Putzonderwater *Pole Evans* 19374H (PRE); Waterberg *Bradfield* 450 (PRE); Keetmanshoop *Fenchal* 171 (K); *Gerstner* 6397 (PRE); Anglo-German Kalahari *Ireland* (BOL).

NAMAQUALAND. Kuboos *Pillans* 5428 (BOL); Okiep *Pillans* 4952 (BOL); s.l. *Zeyher* (K).

KENHARDT. Kakamas *Lewis* (SAM).

PRIESKA. Vogelstruisdrift *Bryant* J166 (PRE).

HAY. Douglas *Burchell* 1741 (K).

KIMBERLEY. De Beers Mine *Wilman* (McG. Mus. 427) (K, PRE); Shaws Drift *Acocks* 2581 (PRE).

CARNARVON. Buffelshout *Burchell* 1613 (K).

DE AAR. De Aar *Theron* 533 (PRE).

FAURESMTIH. Knolfontein *C. A. Smith* 5393 (K, PRE); Berg Riv. *C. A. Smith* 5437 (K); Bokland *C. A. Smith* 4623A (PRE); Ruigtpoort *Henrici* 2610 (PRE); Groenvlei *Rabie* (PRE).

PHILIPPOLIS. Spion Kop *C. A. Smith* 4593 (PRE), 4596 (K); Philippolis *Sidey* 403 (PRE).

G. africana x *namaensis*.

Specimens intermediate between the putative parents have been referred to this hybrid. These range from plants much like *G. africana* but with much shorter leaves and closer inflorescences, on the one hand, to plants like *G. namaensis* but with distant straight leaves on the other.

S.W. AFRICA. Swakop Riv. *Galpin & Pearson* 7480 (K, PRE, SAM).

GORDONIA. Narugas nr. Upington *Moss* 11559 (BM).

PRIESKA. Marydale *Thorne* (SAM).

5. *G. procumbens* L.f. Suppl Pl. 227. 1781.

An erect much branched shrublet 30 cm. to 1 m. high, less often semi-prostrate, often orange or yellow in colour, glabrous or with a few appressed hairs on the youngest parts. Branches opposite, ascending or divaricate, sometimes partly secund. Leaves opposite, deciduous on the older parts, linear, 0.3—0.6 cm. long, squarrose or falcate, hooked at the tip, usually deeply concave above, those on the lateral branches often crowded. Flowers usually few, in lax cymes on branches shorter than surrounding leafy shoots, the ultimate branches of the cyme monochasial. Bracts as long as the flowers: bracteoles short. Perianth segments 4, 1.5—2 mm. long, white or tinged with pink inside, the outer cucullate, the inner with an acute sharply incurved tip. Anthers orange, less often red. Styles 2 or rarely 3; ovary flattened, indented at the top with rounded lateral bulges.

The type is *Linn.f.* 91 in herb. *Linn.* (507: 3).

Rocky or stony places near the margins of the Karoo, especially in the south.

Variable in habit. Though originally described as "procumbent" the commonest forms are erect shrublets and agree completely with the type specimen. Prostrate or semiprostrate forms occur for the most part by roadsides and on overgrazed areas. There are all stages of transition. Owing to this and to the original description of the leaves as "ovate", there has been a good deal of confusion in collections. Specimens have been referred to a variety of species. Some of the larger erect forms have been grouped under the MS name "*G. flavescens*" along with specimens of *G. namaensis*.

NAMAQUALAND. Kamiesberg *Ecklon & Zeyher* (GRA, S).

CALVINIA. Middelpost *Adamson* 5237; Zak Riv. *Burt-Davy* 17560 (GRA).

KIMBERLEY. Riet Riv. *Acocks* 2600 (BOL, K, PRE); Boshof Rd. *Acocks* 8540 (K, PRE).

HERBERT. Douglas *Kotze* 802 (PRE).

BEAUFORT WEST. Beaufort West *Henderson* 11(K); Sunnyside *Esterhuysen* 2739 (BOL); rd. to Aberdeen *Adamson* 5248.

HANOVER. Hanover *Shaw* 50 (K); *Sim* (*Galpin* 5977) (PRE).

MURRAYSBURG. Murraysburg *Tyson* 146 (BM, SAM); Koudeberg *Adamson* 5207—8.

GRAAF-REINET. New Bethesda *Acocks* 13224 (PRE); Graaf-Reinet *Bolus* 102 (BOL, GRA); Koudeberg *Adamson* 5206.

MIDDELBERG. Wapadsberg *Adamson* 5251; Grootfontein *Gill* 32, 82 (PRE); *Theron* 87 (PRE); *Verdoorn* 1522 (PRE), 1605 (BOL. PRE); Middelburg Rd. *Flanagan* 1382 (BM, PRE, SAM); Bangor Farm *H.H. Bolus* (BOL); Rietpoort *Comins* 710 (K, PRE); Naauppoort *Dyer* 1906 (PRE); Culmshoek *Galpin* 7680 (PRE).

CRADOCK. Cradock *Brynard* 154 (PRE); *Dyer* 1027 (PRE).

TARKA. Tarka Riv. *Zeyher* (116, 12) (S).

SOMERSET EAST. Groot Riet Vlei *Acocks* 11959 (PRE); Zwaggershoek *Theron* 50 (BOL, K, PRE).

UITENHAGE. Commonage *Prior* (K).

FAURESMITH. Groenvlei *Verdoorn* 1028 (PRE); Brandfontein *Henrici* 7349 (PRE); Brakpoort *Henrici* 4392 (PRE); *C. A. Smith* 5174 (PRE) Luckhoff *Sidey* 342 (PRE).

KOFFIEFONTEIN. Dreifontein *Kies* 293 (K, PRE).

Without locality:—*Thunberg* (BM).

G. africana x *procumbens*.

Specimens collected at Uniondale (*Adamson* 5188—9) may be this hybrid. They exhibit leaves like those of *G. procumbens* but more widely spaced, white stems, and a lax terminal panicle of small greenish-yellow flowers.

G. namaensis x *procumbens*

Though this hybrid has not been clearly determined, there are specimens which are in many features intermediate between the two closely related species which probably represent it.

6. *G. Ecklonis* Walp. Rep. 2. 232. 1843.

Sialodes glauca E. & Z. Enum. 329. 1837.

G. glauca Sond. Fl. Cap. 2. 478. 1862. *non* Walp.

A procumbent green or yellow-green almost herbaceous plant with many stems from a short woody rootstock. Stems 10—40 cm. long, glabrous or nearly so, sometimes with some appressed hair-like scales on the youngest parts. Leaves opposite, linear-subulate, rolled upwards, 0.5—1 cm. long, often falcate or reflexed, distinctly connate at the sheathing base. Flowers in a lax terminal dichasial cyme. Bracts like the leaves but smaller, straight, not longer than the flowers. Perianth segments 4, 3—4 mm. long, acute, white or red inside, green outside, with a short straight cylindrical mucro at the tip. Anthers pale yellow. Styles 2.

The type is *Ecklon* 2149 (B), lectotype (K).

Sand at low altitudes in the south-west.

Often reddish in the older stages. A very distinctive species, easily recognised by the herbaceous habit, connate leaves and large flowers with

a mucronate perianth. The name, *G. glauca* Sond., by which this has been known, is antedated by *G. glauca* Walp. a synonym of *G. pubescens* var. *pallens*.

PIKETBERG. Piketberg *Guthrie* 2614 (NBG); Piketberg Rd. *Tyson* 2322 (BOL).

MALMESBURY. Malmesbury *Compton* 13253 (NBG); Mamre Rd. *Salter* 4900 (BM, K).

TULBAGH. Winterhoek *Zeyher* (S, SAM); Predikstool *Zeyher* (S); Tulbagh Kloof *Bolus* 7546 (BOL, GRA, K, PRE).

WORCESTER. Villiersdorp *Compton* 22914 (NBG).

PAARL. Hermon *Esterhuysen* 6054 (BOL, K).

STELLENBOSCH. Stellenbosch Flats *Duthie* 1908 (BOL).

Without locality:—*Ecklon* 2149 (K); *Ecklon & Zeyher* (CGE): "Herb. Steudel" (PRE).

Subgen. 2. *Kolleria* cf. p.

KEY TO THE SPECIES.

1. Styles 3, 4 or 5, rarely 2 by reduction.
 2. Perianth segments produced into a cylindrical point.
 3. Leaves rhombic: perianth segments 4—5: styles 4: stems prostrate 15. *prostrata*
 3. Leaves obovate, acute: perianth segments 5: styles 5: stems decumbent-ascending 16. *acutifolia*
 2. Perianth segments not produced into a cylindrical point.
 4. Plants prostrate, secund: inflorescence branches secund.
 5. Glabrous except for a few hairs on the youngest parts.
 6. Leaves linear or linear-lanceolate.
 7. Perianth segments 5: styles 5.
 8. Branches prostrate: leaves flat: flowers crowded on lateral branches 7. *filiformis*
 8. Branches ascending: leaves concave above: flowers solitary, axillary 9. *exigua*
 7. Perianth segments 4: styles 4: leaves concave above 8. *herniariaefolia*
 6. Leaves oblong, elliptical or spatulate, mostly concave above.
 9. Leaves small, succulent: flowers less than 1.5 mm. long: styles 5 11. *subcarnosa*
 9. Leaves not succulent: flowers at least 1.5 mm. long.
 10. Leaves acute: styles mostly 3.
 11. Stems pale or yellow: leaves often sticky, green: flowers large 10. *collina*
 11. Stems white, thickly covered with wax: leaves grayish 14. *pubescens* var. *cerosa*
 5. Hairy, sometimes only on the young parts.
 12. Leaves linear or linear-lanceolate, usually acute.
 13. Stems slender: leaves flat: perianth glabrous: styles usually 5 7. *filiformis*
 13. Stems woody: leaves concave above: perianth hairy: styles usually 3 12. *affinis*

- 12. Leaves obovate or spatulate, usually obtuse
- 14. Plants green, glabrescent.
 - 15. Leaves papulose: flowers on lateral branches: perianth 5: styles 5 14. *pubescens*
 - 15. Leaves finely papulose: flowers axillary: perianth 4: styles 4 14. *pubescens* var. *pallens*
- 14. Plants gray or white, hairy.
 - 16. Leaves small, acute, covered with short appressed hairs: styles 3 12. *affinis*
 - 16. Leaves larger, obtuse, covered with loosely appressed hairs: styles 5 13. *secunda*
- 4. Plants diffuse or ascending, often with secund flowering branches.
 - 17. Glabrous or nearly so.
 - 18. Leaves acute, green: stems yellow: styles 3 10. *collina*
 - 18. Leaves obtuse, spatulate.
 - 19. Leaves papulose, not succulent.
 - 20. Flowers in a terminal forking inflorescence: styles 4 or 5 26. *cymosa*
 - 20. Flowers on secund lateral branches 14. *pubescens* var. *Fourcadei*
 - 19. Leaves succulent, usually coarsely papulose.
 - 21. Leaves persistent: inflorescence secund: stems herbaceous 17. *papulosa*
 - 21. Leaves soon deciduous: inflorescence not secund: stems woody 24. *pruinosa*
 - 17. Covered with hairs or scales, at least on the younger parts.
 - 22. Leaves succulent 18. *sarcophylla*
 - 22. Leaves not succulent.
 - 23. Stems woody: leaves acute, covered with short appressed hairs: styles 3 12. *affinis*
 - 23. Stems herbaceous: leaves obtuse loosely covered with long hairs styles 3 or 5 19. *portulacacea*
- 1. Styles 2.
 - 24. Leaves orbicular, thick: stem densely covered with large papillae 27. *Dregeana*
 - 24. Leaves not orbicular: stems not covered with papillae.
 - 25. Covered all over with flat spreading scales: leaves succulent 20. *squamulosa*
 - 25. Glabrous or covered with appressed hairs or hair-like scales.
 - 26. Succulent: leaves cylindrical-oblong: flowers in a dense terminal panicle 23. *fallax*
 - 26. Usually woody: leaves more or less spatulate: inflorescence mostly secund.
 - 27. Leaves smooth, often white, folded upwards: perianth segments 4 22. *crystallina*
 - 27. Leaves papulose or hairy.
 - 28. Leaves not obviously papulose, hairy, gray inflorescence usually rigid 21. *fruticosa*
 - 28. Leaves papulose.
 - 29. Leaves with appressed hairs or hair-like scales 22. *crystallina*
 - 29. Leaves glabrous or nearly so.
 - 30. Stems with ascending branches: flowers crowded: inflorescence pedunculate 24. *pruinosa*
 - 30. Stems with divaricate branches: flowers in a lax group 25. *hemisphaerica*

7. **G. filiformis** (Thunb.) N.E. Br. *Bothalia* 1. 155. 1923.

Mesembryanthemum filiforme Thunb. Prod. Pl. Cap. 89. 1789. Fl. Cap. ed Schult. 417. 1823.

Prostrate, slender, green or reddish. Stems 20—80 cm. long, branched from the base, with small lateral branches in the flowering region. Young parts either glabrous, minutely papulose, or with few or occasionally many appressed hairs. Leaves alternate, linear or linear-oblong or oblanceolate, usually acute, 0·5—1 cm. long, 0·1—0·3 cm. wide, flat or concave above, glabrous or hairy. Flowers on alternate secund branches, 1—5 cm. long, usually crowded near the base. Bracts leaf-like. Perianth segments 5, about 2 mm. long, glabrous or very thinly hairy. Anthers red, less often yellow. Styles 5 or rarely 3.

The type is in herb. Thunberg, Uppsala.

Sand or gravel, especially in river beds.

Rather variable in the amount of hairs. The type specimen is glabrous but plants otherwise indistinguishable have appressed hairs at least on the young parts.

CALVINIA. Nieuwoudtville *Maguire* 211 (BOL).

HERBERT. Douglas *Orpen* 12, s.n. (SAM); St. Clair *Orpen* 128 (SAM).

HOPETOWN. Hopetown *Marais* 6 (PRE).

SUTHERLAND. Tanqua Riv. *Hutchinson* 674 (BOL).

WORCESTER. Matroosberg Stn. *Adamson* 5096.

LAINGSBURG. Tweedside *Compton* 3063 (BOL).

ROBERTSON. McGregor *Esterhuysen* 4455 (BOL); Ashton *Adamson* 3764.

MONTAGU. Koo *Adamson* 5102; rd. to Barrydale *Adamson* 4644, 5109.

HOPEFIELD. Darling *Stokoe* (SAM).

CAPE. Paarden Is. *Levyns* 5666 (CT); Ndabeni *Adamson* 3133 (CT, SAM).

CALEDON. Sonderende *Adamson* 4574—80.

BREDASDORP. Cape Agulhas *Esterhuysen* 4412 (BOL).

SWELLENDAM. Storms Vlei *Adamson* 4583; *Fries, Norlindh & Weimarck* 1517 (BOL); Breede Riv. *Zeyher* 2637 (S, SAM); Slang Riv. *Adamson* 4609; Malagas *Esterhuysen* 4449 (BOL).

RIVERSDALE. Albertinia *Adamson* 4848.

MOSEL BAY. Herbertsdale *Burchell* 2551 (K).

UNIONDALE. Uniondale *Paterson* 3082 (GRA).

KING WILLIAMSTOWN. K. Williamstown *Tyson* 2925 (SAM).

Without locality:—*Lehmann* (K).

8. **G. herniariaefolia** (Presl) Fenzl in Sond. Fl. Cap. 2. 476. 1862.

Kolleria herniariaefolia Presl Sym. Bot. 1. 24. t14. 1830.

Aizoon microphyllum Bartl. Linnaea 7. 541. 1832.

A. Herniaria Reichb. ex Steud. Nom. ed. 2. 1. 4. 1848.

Prostrate, rather dark green or brownish. Stems woody, up to 75 cm. long, branched, in the upper parts with regular close alternate flowering branches, 1—6 cm. long, which are pinnately or bipinnately branched. Young stems with scattered hairs, the older glabrescent. Leaves small, linear-oblongate, 0.3—0.6 cm. long, 0.1—0.4 cm. wide, concave above, those on the main stem obtuse, those on the branches acute. Flowers usually numerous on the second lateral branches, sessile. Perianth segments 4, 2—3 mm. long, white inside, glabrous outside, spreading at anthesis but incurved later. Anthers pink. Styles 4 or rarely 3.

The type is *Sieber* 164 (O) cotype (K).

Sand at or near the coast in the south-west.

Allied to *G. filiformis* but more woody, with much closer and more regular flowering branches, narrow distinctly concave leaves, and 4-merous flowers. N. E. Brown (Bothalia 1. 155. 1923) says the plant is glabrous but all the specimens seen have hairs on the young parts. Brown (l.c.) quotes *Aizoon microphyllum* Bartl. as a synonym of *G. filiformis*. The type has not been seen but a specimen so named in Bartling's handwriting, *Sieber* 164 (S), is undoubtedly this species.

CAPE. Cape Town *Bolus* 4631 (K); Raapenberg *Guthrie* 707 (CT); Black Riv. *Page* (CT); Roodebloom *Ecklon & Zeyher* 4821 (SAM); Papendorp *Zeyher* (SAM); Rondebosch *Sieber* 164 (K. S); Constantia *Ecklon & Zeyher* 2142 (SAM); Muizenberg *Bolus* 4631 (BOL); St. James *Wolley-Dod* 2168 (BOL); Simonstown *Compton* (CT); *Wolley-Dod* 2062 (K); *Wright* (K); Paarden Is. *Adamson* 1448 (BOL); Milnerton *Adamson* 2655, 4756; *L. Bolus* (BOL); *Compton* 13056 (NBG); *Moss* 2407 (BM).

CALEDON. Onrust *Schlechter* 9481 (GRA, K); *v. Niekerk* 344 (BOL). SWELLENDAM. Storms Vlei *Adamson* 4586A; Infanta *Adamson* 4867.

RIVERSDALE. Botteliersfontein *Muir* 1824 (BOL).

GEORGE. Montagu Pass *Adamson* 5178.

9. **G. exigua** Adamson sp. nov.

Subglabra procumbens ramulis ascendentibus. Folia lineari-oblongata supra canaliculata minute papulosa. Flores axillares solitarii. Perigonii segmenta 5. Style 5; ovarium latissimum apice depressum.

A small darkish green almost glabrous plant with many procumbent stems and alternate ascending branches. Stems 10—20 cm. long. Leaves alternate, linear-oblongate, 0.8—1.5 cm. long, 0.1—0.3 cm. wide,

distinctly narrowed to the base, concave above, subobtusate, often horned at the tip, very finely papulose, glabrous except for a few scattered hairs on the youngest. Flowers solitary, axillary, much shorter than the leaf-like bracts. Perianth segments 5, 1.5—2 mm. long, usually erect, the outer distinctly cucullate, the inner incurved at the tip. Anthers yellow or pink. Styles 5: ovary broadly pentagonal, more than twice as wide as deep, slightly depressed on top.

The type is *Acocks* 1900 (PRE).

Open places in the north-western karroo.

Allied to *G. filiformis* but differing in habit, the more concave and almost petiolate leaves, the cucullate perianth, and the broad 5-chambered ovary.

HERBERT. Douglas *Acocks* 1900 (PRE); Salt Lake Hill *Esterhuysen* 4225 (BOL, K.).

KIMBERLEY. Magersfontein *Wilman* (McG, Mus. 3417) (BOL, K); Mauritzfontein *Acocks* 64 (PRE).

HOPETOWN. Hopetown *Acocks* 14347 (PRE).

JAKOBSDAL. Jakobsdal *Codd* 3425 (PRE).

10. *G. collina* (E. & Z.) Walp. Rep. 2. 232. 1843.

Kolleria collina E. & Z. Enum. 327. 1839.

G. humifusa Fenzl in Sond. Fl. Cap. 2. 476. 1862.

A green almost glabrous diffuse, decumbent or prostrate shrublet, often sticky. Stems from a woody base, much branched, up to 50 cm. long, the younger yellow or white. Leaves green, glabrous or the youngest with a few appressed hairs, often sticky, acute, rather variable in size and shape, the lower sub-opposite, oblanceolate or oblong-spatulate, more or less petiolate, 0.5—2.5 cm. long, 0.3—0.6 cm. wide, flat or folded upwards, often partly opposite, the upper alternate, sessile, 0.4—1 cm. long, 0.2—0.4 cm. wide, usually concave above. Flowers on alternate second lateral branches 1—3 cm. long, sometimes with short branchlets. Flowers in cymose groups, often crowded, the central flower sessile, the lateral on branchlets 1—3 mm. long. Bracts leaf-like, much longer than the flowers. Perianth segments 5, 2.5—3 mm. long, white or yellowish, more or less cucullate. Anthers yellow or pink. Styles 3, less often 5.

The type is *E. & Z.* 2143 (B), lectotype (S).

Open ground, most often rocky.

Readily distinguished by the acute glabrous green leaves, yellow stems and rather large flowers. The lower leaves fall off at or about flowering time.

S.W. AFRICA. Aus *Dinter* 4154 (BM).

NAMAQUALAND. Okiep *Pillans* 4767 (BOL); Orange Riv. *Drege* (S, SAM); Groot Derm *Pillans* 5595 (BOL, K); Lekkersing *Taylor* 1126

(BOL); Steinkopf *Schlechter*, s.n. (BM, BOL, K); Witbank *Pillans* 5550 (BOL, K); Bowesdorp *Schlechter* 11216 (BOL, PRE); Kamieskroon *Thorne* (SAM); Wallekraal *Adamson* 5023, 5048. Hondeklip Bay *Adamson* 5041; *Pillans* (BOL); Bitterfontein *Zeyher* 722 (BM, CGE, K, PRE, S, SAM).

CALVINIA. Nieuwoudtville *Lavis* (BOL).

VAN RHYNSDORP. Van Rhyns Pass *Adamson* 4545; Van Rhynsdorp *Adamson* 4977; Knechtswlakte *Schlechter* 8157 (BM, BOL, GRA, K, PRE); Nieuwerust *Adamson* 4986, 4989.

KIMBERLEY. Alexandersfontein *Power* (PRE); Poljaspoort *Acocks* 524 (PRE).

LAINGSBURG. Cabidu *Barker* 6784 (NBG).

CALEDON. Swartberg *Ecklon & Zeyher* 2143 (S, SAM); Dasberg *Stokoe* (SA).

RIVERSDALE. Garcias Pass *Adamson* 4858.

GEORGE. Top of Montagu Pass *Adamson* 5179.

Without locality:—*Masson* (BM).

Var. **Meziana** *Adamson* comb. nov.

G. Meziana K.Müll. Bot. Jahrb. 43. Beibl. 97. 68. 1909.

G. Dinteri Schellenb. Bot. Jahrb. 48. 501. 1913.

Usually quite prostrate, more slender, not sticky, with appressed hairs on the younger parts. Leaves narrower, linear-oblongate, not petiolate, flat, 1—2 cm. long, not over 0.3 cm. wide. Flowers smaller, 1—1.5 mm. long, mostly in axillary groups. Perianth usually slightly hairy. Ovary wider than long: styles 3 or 4.

The type is *Schlechter* s.n. (B); neotype *Schlechter* 34 (K).

Dry open sand or gravel in Namaqualand and S.W. Africa.

Rather variable in the amount of hairs. *G. Meziana* was originally described as having 5 stamens only. This appears to be a rare condition. All the specimens seen have 10. *G. Dinteri* and *G. Miziana* are the same and cannot be separated.

S.W. AFRICA. Aus *Dinter* 6094 (BM, BOL, K).

NAMAQUALAND. Steinkopf *Schlechter* 34 (BOL, K, PRE); Wolfhoek *Esterhuysen* 1331 (BOL).

11. ***G. subcarnosa*** *Adamson* sp. nov.

Prostrata. Folia parva subcarnosa acuta pruinoso-papulosa. Flores in ramis secundis aggregatis. Perigonii segmenta 5, styli 5.

Prostrate, very commonly red or purple, forming circular mats or patches 10—25 cm. across. Young stems and leaves pruinose or finely papulose with a few appressed scales. Leaves small, 3—7 mm. long, 1—3 mm. wide, thick, acute or subacute, concave above, narrowed to

the base, usually much crowded. Flowers on short alternate secund lateral branches. Bracts like small leaves. Perianth segments 5, 1.5 mm. long, finely papulose, incurved at the tip. Styles 5; ovary 5-angled, broader than deep.

The type is *Acocks* 14358 (PRE).

Open rocky places on the karoo.

A distinctive species recognised by the mat habit, small thick folded leaves which are pruinose-papulose, and 5-merous flowers on small lateral branches.

MIDDELBURG. Carlton Hills *Acocks* 15934 (PRE).

VICTORIA WEST. N. of Victoria West *Acocks* 14358 (PRE).

SUTHERLAND. Sutherland *Acocks* 16980 (PRE).

BRITSTOWN. S. of Britstown *L. E. Taylor* 907 (BOL); *Marloth* 9813 (PRE).

KIMBERLEY. Roodepan *Acocks* H867 (PRE); Orange River *L. Gibbs* (BM).

S. RHODESIA. Matopos *L. Gibbs* 12 (BOL).

12. *G. affinis* Sond. Fl. Cap. 2. 476. 1862.

Gray or reddish, rarely green. Stems woody, prostrate or ascending, rarely over 30 cm. high, with spreading secund branches. Stems pale-coloured, pruinose, the younger with short appressed hairs. Leaves mostly alternate, distant or crowded, obovate or spatulate, 0.5—1.2 cm. long, 0.2—0.4 cm. wide, acute, folded upwards and concave above, covered either densely or sparsely with short closely appressed hairs. Flowers on short pinnate secund branches. Bracts like the leaves but smaller, longer than the flowers. Perianth segments 5, 1.5—2 mm. long, hairy outside. Anthers yellow. Styles 3, less often 5.

The type is *E. & Z.* 2139 (S).

Rather rare on rocky koppies on the karoo.

Distinguished by the small acute hairy leaves. Sonder (l.c.) describes the plant as erect but most of the specimens seen are prostrate or sprawling.

NAMAQUALAND. Bitterfontein *Zeyher* 724 (BM, BOL, CGE, K, S).

WILLISTON. N. of Williston *Acocks* 14721 (PRE).

COLESBURG. Coleskop *Thorne* (SAM).

MONTAGU. Baden *Levy* 8016 (CT).

SWELLENDAM. Hassequas Kloof of *Ecklon & Zeyher* 2139 (S, SAN).

RIVERSDALE. Gouritz Riv. *Burchell* 6498 (K).

Without locality:—*Drege* (*Tephros pubescens* E.M.) (K).

13. *G. secunda* (L.f.) Sond. Fl. Cap. 2. 474. 1862.

Aizoon secundum L. f. Supp. Pl. 261. 1781.

A. contaminatum E. & Z. Enum. 326. 1837.

A. elongatum E. & Z. l.c.

A. propinquum E. & Z. l.c.

A prostrate many-stemmed plant covered with coarse villous loosely appressed hairs, usually white, gray or yellow. Stems 10—50 cm. long, woody at the base, secund, branched from the base, with in the distal part many short flowering branches 1—5 cm. long standing out at right angles. Leaves alternate, coarsely papulose, those on the main shoots broadly obovate, 0.7—2 cm. long, 0.4—1.2 cm. wide, obtuse, narrowed to the base, flat or concave above, often partly or wholly glabrescent in the later stages, deciduous at or about flowering time. Leaves on the lateral branches smaller, more acute, usually folded upwards, and persistent. Flowers on the short lateral branches, solitary or in groups of 2—5 on short branchlets. Bracts leaf-like; bracteoles very short. Perianth segments 5, 2—3 mm. long, coarsely villous, yellow or white inside, the tips incurved. Anthers yellow, less often red. Styles 5 or occasionally 3. Fruit rounded, depressed on top.

The type is in herb. *Thunberg*, Uppsala.

Open places on sand or gravel in the coastal belt and at the margins of the karroo. Wide-spread but certainly extending along roadsides and in disturbed ground.

Distinguished by the coarsely villous rather broad leaves and large 5-merous flowers. Very variable in habit, in the number and closeness of the branches, the closeness of the leaves, and in the density of the hairy covering. Extreme forms look distinct but are connected by all stages or intermediate. While most commonly the shoots are separate, sometimes close mats are formed. Forms with very crowded leaves may resemble species of *Plinthus*. In general plants from the drier habitats or from sea-side stations have more numerous and more persistent hairs than those from moister inland stations. Var. *strigulosa* Sond. l.c. is merely an especially glabrescent form. In the more hairy forms the papulose leaf surface is obscured. The various species described by Ecklon & Zeyher l.c. are not more than habitat or seasonal states and cannot be maintained.

S.W. AFRICA. Gr. Kalk *Thorne* (SAM); Buntfeldschuh *Dinter* 3936 (BOL, PRE).

KENHARDT. Nagbult *Acocks* 12650 (PRE).

PRIESKA. Prieska *Bryant* 1151a (K, PRE); *Page* (BOL).

WILLISTON. Rietkokoos *Acocks* 9618 (PRE).

CARNARVON. Carnarvon *Henrici* 25 (PRE).

VAN RHYNSDORP. Van Rhynsdorp *Thode* A1896 (PRE); Knechtsvlakte *Schlechter* 8312 (BM, GRA, K, PRE).

CLANWILLIAM. Matjes Riv. *Wagener* 146 (NBG).

PIKETBERG. Sauer *Compton* 15094 (NBG).

CERES. Laken Vlei *Compton* 12079 (NBG); Hottentots Kloof *Adamson* 5016 (PRE).

WORCESTER. Brandvlei v. Breda 816 (PRE); Karroo Gd. *Cross* 48 (BOL, NBG).

LAINSBURG. Whitehill *Compton* 3604 (BOL, NBG), 15233 (NBG), 17407 (NBG) Pieter Meintjes *Rogers* (BOL).

BEAUFORT WEST. Nieuwveld Mts. *Adamson* 5212, 5214; rd. to Aberdeen *Pole Evans* 11 (PRE).

ABERDEEN. Aberdeen Rd. *Pole Evans* 2541 (K).

MURRAYSBURG. Murraysburg *Tyson* 12 (BOL), 429 (K, SAM).

GRAAF REINET. Graaf Reinets *Adamson* 5274; *Maguire* 704 (NBG).

MIDDELBURG. Middelburg *Acocks* 15944 (PRE); *Theron* 850 (PRE); Middelburg Rd. *Flanagan* 1694 (PRE, SAM); Naauwpoort *Rogers* 12030 (PRE).

CRADOCK. Cradock *Rogers-Wolfe* (BOL); Mortimer *Bolus* 9218 (BOL, K), 9268 (K).

QUEENSTOWN. Klipplaat Riv. *Thode* A571 (K).

KIMBERLEY. Alexandersfontein *Brueckner* 944 (BOL, K, PRE); Mosterts Hoek *Hafstrom & Acocks* H1002 (PRE).

CAPE. Green Point *Adamson* 1827 (BOL, PRE); *Dawson* (BOL); *Salter* 7678 (CT); *Stokoe* (SAM); *Zeyher* (SAM); Mouille Pt. *Levy's* (CT); Three Anchor Bay *Salter* 6397 (CT); Sea Point *Adamson* 3096; Milnerton *Adamson* 4755; St. James *Moss* 18039 (BM); Robben Is. *Adamson* 3932; Rondebosch *Adamson* 4466.

ROBERTSON. Robertson *Adamson* 4651; *Levy's* 4321 (CT); *Zeyher* (SAM); Nuy *Adamson* 4462; McGregor *Esterhuysen* 4454 (BOL).

MONTAGU. Wagonboomsberg *Adamson* 5097; Concordia *Barnard* 759 (SAM).

LADISMITH. Dobelaarskloof *Levy's* 6697 (CT).

SWELLENDAM. Storms Vlei *Adamson* 4931 (PRE); *Ecklon & Zeyher* 2134 (S); *Levy's* 3476 (CT); Swellendam *Zeyher* (SAM); Hassequaskloof *Ecklon & Zeyher* 2134 (PRE); *Zeyher* (SAM); rd. to Port Beaufort *Adamson* 4604.

RIVERSDALE. Riversdale *Muir* 2737 (PRE); *Schlechter* 1807 (BM, K, PRE); Oakdale *Levy's* 2657, 3162, 4182 (CT); *Muir* 106 (BM, SAM), 2399 (PRE).

MOSSSEL BAY. Mossel Bay *Rogers* 17796 (K), 26953 (K); Gouritz Riv. *Burchell* 4389 (K); *Schlechter* 5719 (BOL); *Zeyher* 1 (SAM).

GEORGE. Kromme Riv. *Bolus* 1866 (BOL).

OUDTSHOORN. Cango *Bolus* 11915 (BOL); Oudtshoorn *Rogers* 4268a (K).

UNIONDALE. Avontuur *Fourcade* 1661 (GRA, PRE).

UITENHAGE. Uitenhage *Compton* 20304 (NBG); *Ecklon & Zeyher* (GRA); *Prior* (K); *Schmitz* (PRE); *Schlechter* 2561 (BOL, K); *Prior* (K); *Zeyher* (SAM); Swartkops Riv. *Ecklon* (S); *Ecklon & Zeyher* 189 (BOL), 2131 (BOL); 2132 (GRA, K, SAM); *Sieber* 2132 (S); *Zeyher* 189 (BOL, K), 2633 (K, PRE, S, SAM), s.n. (SAM); Paadepoort *Bolus* 1866 (BOL).

PORT ELIZABETH. Port Elizabeth *Cruden* 471, 483, 484 (GRA); *Paterson* (CGE); Humewood *Pillans* (SAM); Redhouse *Paterson* 3232 (CGE); *Perseverance Rodin* 1283 (BOL, K, PRE).

ALEXANDRIA. Nanaga *Acocks* (PRE); *Story* 1299 (K, PRE), 1300 (PRE).

ALBANY. Alicedale *Cruden* 141 (GRA); *Rogers* 12030 (BOL, K); Bushmans Riv. *Maguire* 528 (NBG); Grahamstown *Dyer* 1680 (GRA, K); *MacOwan* 445 (GRA); Bothas Hill *Britten* 5299 (GRA); West Hill *Adamson* 4762; Lombards Post *Burchell* 3913 (K); Cradock Rd. *Adamson* 5260; s.l. *Bowker* (K); *Cooper* (BM, K).

BATHURST. Kowie *Britten* 1906 (GRA PRE); *Tyson* (BOL); s.l. *Bowker* (K); *Cooper* 7 (BM, K).

EAST LONDON. E. London *Galpin* 5844 (GRA); Nahoon *Nanni* 129 (PRE).

FAURESMITH. Lückoff *C. A. Smith* 485 (BM), 3516 (BOL); Rose Marie *Kies* (PRE).

NATAL. s.l. *Cooper* 1281 (BOL, K) (NB. On the ticket of *Pillans* Humewood is written "Berea, Durban").

Without locality:—*Boivin* (BOL); *Burt-Davy* 11959 (PRE); *Drege* 7061a (K), 'CBS' (PRE); *Ecklon* (BOL); *Ecklon & Zeyher* 2134 (K); *Prior* (K); *Sim* 2664 (PRE); *Zeyher* 2132 (K), 2134 (K), s.m. (S).

Also recorded as an alien from Australia (Bot. Gds. Sydney 26301 (K) and from U.S.A. (*Curtis* 6819, *Sheldon* 10101 (K)).

14. *G. pubescens* (E. & Z.) Druce Rep. Bot. Ex. Cl. Brit. Is. 1916. 624. 1917.

Aizoon pubescens E. & Z. Enum. 326. 1837.

G. spathulata Fenzl in Sond. Fl. Cap. 2. 475. 1862.

Prostrate, in green or gray-green patches 1 m. or more across. Young parts with closely appressed rather coarse hairs, the older glabrescent. Stems woody at the base, 25 cm.—1.5 m. long, much branched, the branches often ascending. Leaves alternate, papulose, those on the main shoots broadly obovate-spatulate, 0.6—2.2 cm. long, 0.3—1.7 cm. wide, obtuse or subobtuse, narrowed at the base, those on the branches

smaller, more acute, often concave above. Flowers on alternate secund lateral branches 2—8 cm. long, either distant or crowded, and often themselves branched. Flowers solitary or with a pair of branchlets from the base 1—3 mm. long, each bearing 1—3 flowers. Bracts like leaves but smaller, less narrowed at the base, and usually folded upwards. Perianth segments usually 5, 2—2.5 mm. long, slightly incurved at the tip, with few or many closely appressed hairs outside, pinkish inside. Anthers usually pink. Styles 5, less often 3.

The type is *Zeyher* 2638 (S).

Bushy places at low altitudes especially where sheltered. Drought resistant and common on roadsides and in disturbed areas. Has been utilised as a fodder plant in drought, certainly alien in some of its stations.

Rather like *G. secunda* but less strictly prostrate, more branched, much less hairy, and with the hairs closely appressed. Distinguished by the broad papulose glabrescent leaves and the rather irregular arrangement of the flowering branches which commonly grow out as long shoots, or are formed at the base of long shoots. The leaves on the main stem fall at or about flowering time.

VRYBURG. Taungs *Parker* (PRE).

HAY. Floradale *Esterhuysen* 2319 (BOL, PRE).

KIMBERLEY. Kimberley *Esterhuysen* 821 (BOL); *Farrer* (GRA); *Moran* 56, 98 (GRA).

BARKLY WEST. Daniels Kuil *Esterhuysen* 812 (BOL).

HERBERT. Valschfontein *Esterhuysen* 5150 (BOL).

CLANWILLIAM. Herculesfontein *Zeyher* 3 (GRA).

CERES. Basson's Gat *Burchell* 1251 (K).

RICHMOND. Rhenosterfontein *Acocks* 15841 (PRE).

MURRAYSBURG. Murraysburg *Tyson* 254 (SAM).

CRADOCK. Cradock *Brynard* 275 (K); *Convent* 29 (GRA); *Cooper* 518 (BM, BOL, K).

CAPE. Ndabeni *Adamson* 3159, 3212 (CT); Pinelands *Adamson* 3312 (CT, PRE); *Salter* 8621 (BOL); Camps Bay *Adamson* 3544 (BOL); *Levy's* (CT); *Salter* 8783 (BOL).

BREDASDORP. Bontebok Park *Compton* 22615 (NBG); rd. to Swellendam *Esterhuysen* 19556 (BOL).

ROBERTSON. Robertson Karroo *Compton* 5735 (NBG).

MONTAGU. Montagu *Page* 41 (PRE).

SWELLENDAM. Dipka *Adamson* 4606—7.

HEIDELBERG. Barrydale *Adamson* 4616.

RIVERSDALE. Riversdale *Schlechter* 1817 (GRA); Gouritz Riv. *Schlechter* 5719 (BMK, PRE); coast *Muir* 4709 (BOL).

MOSSEL BAY. Herbertsdale *Burchell* 6419 (K); Mossel Bay *Guthrie* 3981, 4317 (NBG).

HUMANSDORP. Mind Plaas *Fourcade* 6061 (BOL); Gamtoos Riv. *Fourcade* 2578 (BOL).

UNIONDALE. Uniondale *Fourcade* 4658 (BOL).

UITENHAGE. Uitenhage *Ecklon* (S); *Ecklon & Zeyher* 188 (BOL, GRA, K), 2133 (BOL, K); *Marais* 142 (K, PRE); *Pappe* (K); *Thode* 4654 (K); *Zeyher* (S); Swartkops Riv. *Zeyher* 188 (SAM), 2635 (SAM), 2638 (S), s.n. (SAM); Enon *Thode* A2663 (PRE); Hankey *Fourcade* 2578 (K); Coega *Rogers* 2275 (K).

PORT ELIZABETH. Port Elizabeth *Paterson* (CGE); Redhouse *Mogg* 4764 (PRE); Swartkops *Brock* 16 (GRA); Addo rd. *Eries, Morlindh & Weimarck* 781 (BOL); Addo Reserve *Brynard* 331 (K), s.n. (PRE).

ALBANY. Alicedale *Cruden* 93 (GRA); *Rogers* 12123 (BOL, K); Swartkops Riv. *Burchell* 6419 (K); Grahamstown *Adamson* 5269, 5272, 5275; *Bolton* (S); *Lindstedt* 34 (PRE); *Rogers* 2606 (BOL), 3778 (GRA), 2736 (GRA, K, PRE); Highlands *Turberville* (PRE); Belmont valley *Adamson* 5253; Cradock rd. *Adamson* 5259, 5261—4; West Hill *Adamson* 4713; Bushmans Riv. *Baur* 1098 (K); Assegai Riv. *Compton* 19062 (NBG); Fish Riv. *Adamson* 4929; s.l. *Cooper* 7 (BOL, K).

BATHURST. Port Alfred *Bolus* (BOL); *Britten* 786 (GRA, PRE); *Compton* 21084 (NBG); *Dyer* 634 (PRE); *Schonland* 180 (GRA); *Tyson* (*Marloth* 8583) (PRE).

PEDDIE. Keiskama mouth *Mills* (BOL).

KING WILLIAMSTOWN. Debe Nek *Rogers* 4466 (BM, BOL, CGE, SAM); King Williamstown *Tyson* 1033 (BOL, SAM), 6091 (SAM).

EAST LONDON. Selborne *C. A. Smith* 3694 (PRE), *Galpin* 1837; Flagstaff Hill *Galpin* 5844 (PRE); E. London *Worsdell* (K).

KOMGHA. Kei Bridge *Flanagan* 119 (BOL, NBG, SAM).

STUTTERHEIM. Stutterheim *Acocks* 9027 (PRE).

VICTORIA EAST. Garfield *Acocks* 11093 (PRE).

QUEENSTOWN. Essex *Adamson* 5271; *Bolus* (BOL).

O.F.S. Kroonstadt *Pont* 320 (PRE); Bloemhof *Burt-Davy* 1537 (K).

Without locality:—*Burt-Davy* 1495 (K); 7826 (PRE); *Drege* 571a & b (K), *G. spathulata* d (S); *J. F. Drege* 3011 (PRE); *Ecklon & Zeyher* 2133 (K, PRE); *Flanagan* (PRE); *Fourcade* 2782 (BOL); *Rogers* 17164 (PRE).

G. pubescens is a variable species. In addition to variations it can be related to habit, season, etc.. There are several well-marked varieties.

KEY TO THE VARIETIES.

1. Stems and leaves with appressed hairs at least when young.
2. Flowers on second branches: perianth 5: styles 5.
 3. Leaves alternate: perianth hairy var. *pubescens*
 3. Leaves opposite: perianth glabrous var. *Fourcadei*
2. Flowers axillary: perianth 4: styles 4 var. *pallens*

1. Stems and leaves without hairs: stems white.

4. Stems densely papillose: leaves papulose: perianth 5:
 styles 5 var. *lignosa*
 4. Stems thickly covered with wax: leaves waxy-pruinose
 perianth 5: styles 3—4 var. *cerosa*

Var. **pallens** Adamson comb. nov.

G. pallens (E. & Z.) Walp. Sep. 2. 232. 1843.

Kolleria pallens E. & Z. Enum. 328. 1837.

K. glauca E. & Z. l.c.

G. glauca Walp. l.c.

Glabrous except for scattered hairs on the youngest parts. Leaves gray or gray-green, thinner, usually folded upwards, very finely papulose. Flowers axillary, not on lateral branches, usually in groups of 3, the lateral on branchlets 2—5 mm. long. Bracts leaf-like. Perianth segments 4, papulose on the back. Styles 4.

The type is *Zeyher* 2636 (S).

Apparently rare in the Uitenhage district. Not collected within recent years.

Usually quoted as "*G. pallens* Fenzl" (e.g. Fl. Cap.) but the combination was first made by Walpers.

UITENHAGE. Swartkops Riv. *Ecklon & Zeyher* 2144, 2145 (GRA, SAM), s.n. (S) *Zeyher* 1049 (BOL, GRA, K, SAM), 2636 (K, S, SAM).

Without locality:—*Drege* (*Tephros humifusa* E.M.a) (BM, CGE, K): *Ecklon & Zeyher* s.n. (CGE).

Var. **lignosa** Adamson var. nov.

A typo differt caulibus lignosis prostratis junioribus dense papuloso-papillosis, foliis subglabris, floribus axillaribus solitariis 5-meris.

Prostrate. Stems woody, the younger densely covered with white papulose papillae. Leaves glabrous except for a few scattered appressed hairs on the youngest, rather coarsely papulose. Flowers on the main stem and branches, not crowded. Perianth segments 5. Styles 5.

The type is *Mogg* 8109 (PRE).

VRYBURG. Armoeds Vlakte *Mogg* 3960, (PRE), 8109 (CGE, PRE).

BARKLY WEST. Hartsrivier *Marloth* 976 (PRE).

KIMBERLEY. Kenilworth *Ferrer* (K).

Without locality:—*Burt-Davy* 13108 (PRE).

Var. **cerosa** Adamson var. nov.

A typo differt caulibus lignosis ascendentibus albis densissime cerosis, foliis glabris junioribus ceroso-pruinosis veteribus papulosis floribus solitariis, perigonii segmentis 5, stylis 3 raro 4.

Decumbent with ascending branches, glabrous but wax-covered. Stems white, woody, with a thick rough coating of wax. Leaves alternate,

pale-coloured, oblanceolate, 0·5—1·3 cm. long, 0·2—0·3 cm. wide, flat or often folded. Young leaves covered with wax, the older papulose. Flowers on lateral second branches, solitary or each with a single short branchlet. Bracts leaf-like, longer than the flowers. Bracteoles as long as the flowers. Perianth segments 5, 1·5—2 mm. long, thin, papulose on the back. Anthers mostly pink. Styles 3, rarely 4 or 5. Ovary flattened.

The type is *Esterhuysen* 811 (BOL).

Local in the Bechuanaland region.

HAY. Postmasburg *Esterhuysen* 811 (BOL); Matsap *Acocks* 2233 (BOL, K, PRE).

Var. **Fourcade** Adamson var. nov.

A typo differt caulibus diffusis, foliis oppositis subglabris, inflorescentia laxa secunda ramis distantibus.

Suberect or diffuse but often with semiprostrate branches. Glabrous except for scattered hairs on the youngest parts. Leaves opposite, dark green, papulose, oblong-spatulate, 1—1·7 cm. long, 0·3—0·5 cm. wide, usually folded upwards. Inflorescence spreading, second, 5—15 cm. long, with alternate divaricate branches 0·5—1·5 cm. long and about 1 cm. apart. Flowers in lax groups of 3—5. Bracts leaf-like. Perianth segments 5, glabrous. Styles 5.

The type is *Fourcade* 4660a (BOL).

UNIONDALE. Uniondale *Fourcade* 4660a, 6460, (BOL).

15. **G. prostrata** Schellenb. Bot. Jahrb. 48. 506. 1913.

A slender prostrate many-stemmed gray-green plant in circular patches 50—80 cm. across. Stems with opposite branches, the younger covered with appressed hairs, the older glabrescent. Leaves opposite, rhombic-spatulate, 0·6—1 cm. long, 0·3—0·5 cm. wide, narrowed to a petiole at the base, acute or obtuse-mucronate at the tip, thinly covered with appressed hairs. Flowers crowded on second lateral branches. Perianth segments 4—5, 2—3 mm. long, pinkish, thinly hairy outside, with a cylindrical acuminate projection behind the incurved tip. Anthers usually pink. Styles 4, less often 3 or 5.

The type is *Bolus* 6815 (B), lectotype (BOL).

Readily distinguished by the opposite rhombic leaves and the perianth with acuminate tip. Originally described as near to *G. Ecklonis* (glauca) but except for a similarity in the perianth there does not seem any close affinity.

BARKLY WEST. Barkly West *Bolus* 6815 (BOL).

KIMBERLEY. Kimberley *Acocks* 1630 (PRE); *Flanagan* 1480 (BOL, SAM); *Wilman* (PRE).

PRIESKA. Prieska *Bryant* 1151b (K).

HANOVER. Hanover *Sim* (*Galpin* 5978, 5979) (PRE).

MURRAYSBURG. Murraysburg *Adamson* 5219; Koudeberg *Adamson* 5210.

MIDDELBURG. Gordonville *Acocks* 16559 (PRE).

QUEENSTOWN. Queenstown *Bolus* (BOL); Lesseyton Mt. *Galpin* 1941 (PRE).

PHILIPPOLIS. Philippolis C. A. Smith 4592 (PRE).

FAURESMITH. Veld Res. *Henrici* 2890 (PRE); C. A. Smith 4607 (PRE); *Verdoorn* 979 (PRE); Fauresmith *Brueckner* 962 (PRE); C. A. Smith 4599 (PRE).

BETHULIE. Orange Riv. *Flanagan* 1480 (PRE).

BLOEMFONTEIN. Bloemfontein *Potts* 2830, 3363 (PRE).

16. *G. acutifolia* Adamson sp. nov.

Suffruticosa, sparse pilosa vel glabrescens. Folia opposita, acuta obovata petiolata saepissime rubro-marginata. Flores axillares solitarii. Perigonii segmenta 5 in mucrone angusto producta. Styli 5.

Stems many, decumbent or ascending, from a thick woody rootstock. Young parts thinly appressed hairy, the older glabrescent. Leaves gray-green, opposite, acute, obovate or rhombic-ovate, commonly red at the edge, 8—12 mm. long, 4—5 mm. wide, narrowed at the base to a petiole 2—3 mm. long. Flowers sessile, axillary, on branches 1—2 cm. long, often rather crowded. Bracts like the leaves but smaller and less petiolate: bracteoles slightly longer than the flowers, obtuse or emarginate. Perianth segments 5, 2—2.5 mm. long, pale cream-coloured or pinkish, slightly hairy outside, produced behind the incurved tip into a slender point about 1 mm. long. Anthers yellow. Styles 5, rather short.

The type is *Esterhuysen* 813 (BOL).

Allied to *G. prostrata* but more woody, less prostrate, less hairy, with narrower more acute leaves, and more crowded flowers.

BARKLY WEST. Newlands *Esterhuysen* 813 (BOL); Caerwinning *Esterhuysen* 814 (BOL).

17. *G. papulosa* (E. & Z.) Sond. Fl. Cap. 2. 475. 1862.

Aizoon papulosum E. & Z. Enum. 326. 1837.

A green or yellow-green glistening almost herbaceous plant, in bunches 10—40 cm. high, often with spreading or decumbent branches. Stems and leaves covered with large obtuse transparent papillae but without hairs or scales. Leaves succulent, alternate, obtuse, the lower broadly oblong or rotund, petiolate, 1—3 cm. long, 0.8—1.7 cm. wide, the upper smaller subsessile, flat or often folded and concave above. Flowers in lax,

more or less secund cymes, with bracts like the leaves but much smaller. Bracteoles thick, about as long as the flowers. Perianth segments 5, 1.5—2 mm. long, papulose on the outside, incurved at the tip. Anthers yellow, rarely red. Styles 3, less commonly 5.

The type is *E. & Z.* 2137 (B), lectotype (SAM).

River beds and sheltered places in the karoo, especially on shales.

Readily recognised by the coarsely papulose succulent leaves without hairs or scales. The lower broader leaves fall off about flowering time. Allied to *G. sarcophylla* but less woody and without hairs.

S:W: AFRICA. Swakopmund *Pearson* 531 (K, SAM); Windhoek *Dinter* 348 (BM, K, SAM); *Rogers* 29520 (PRE); Hereroland *Balck* 15 (K); Aus *Dinter* 6239 (BM).

NAMAQUALAND. Steinkopf *Schlechter* 34 (GRA), 38 (GRA); *Zywarts Pillans* (SAM).

CALVINIA. *Calvinia Macpherson* 3689/14 (BCL); de Bosch *Adamson* 4555.

GORDONIA. Keimoes *Barnard* (SAM).

PRIESKA. Prieska *Lloyd* (PRE).

VAN RYHNSDORP. Klaver *Stokoe* (SAM).

BRITSTOWN. Britstown *Page* (BOL).

VICTORIA WEST. Hutchinson *Acocks* 9716 (PRE); Victoria West *Thode* A1897 (PRE); Pampoenpoort *Henrici* 4768 (PRE).

FRASERBURG. Fraserburg. *Hafstrom & Acocks* 423 (PRE); rd. to Sutherland *Hafstrom & Acocks* 721 (PRE).

SUTHERLAND. Tanqua Riv. *Compton* 7536 (NBG); Roggeveld *Worsdell* (K).

BEAUFORT WEST. Krom Riv. *Goatcher* (BOL).

ABERDEEN. Groot Riv. *Hutchinson* 3136 (K).

MURRAYSBURG. Murraysburg *Bolus* 28 (BM, BOL, SAM); *Tyson* 28 (K).

PRINCE ALBERT. Fraserburg Rd. *Thorne* (SAM); Prince Albert *Bolus* 11515 (BOL, K, PRE); *Krige* (BOL).

LAINGSBURG. Koup *Compton* 10403 (NBG); *Esterhuysen* 4509 (BOL); Laingsburg *Adamson* 4693; Whitehill *Compton* 9296, 11269 (NBG). Matjesfontein *Fries, Norlindh & Weimarck* 736 (BOL).

PIKETBERG. Piketberg *Bolus* (BOL).

LADISMITH. Groot Riv. *Adamson* 4623—6.

HEIDELBERG. Lemoenshoek *Adamson* 4590; Warmwaterberg *Adamson* 4622, 4628, 5129.

MOSSEL BAY. Gouritz Riv. *Ecklon & Zeyher* 2137 (SAM).

GEORGE. Camfer *Fourcade* 5677 (BOL).

UNIONDALE. Rd. to Willowmore *Fourcade* 4654 (BOL, K); *Pole Evans* 20 (PRE).

JANSENVILLE. Klipplaat *Thode* A.572 (PRE).

FORT BEAUFORT. Klipbank *Rogers* 17118 (PRE).

Without locality:—*Burtt-Davy* 12648 (PRE): *Drege* (*Tephros papulosa*) (CGE); *Rogers* 200 (BOL).

Var. *microphylla* Adamson var. nov.

A typo differt caulibus fruticosis, foliis anguste oblongis, stylis saepissime 5.

Stems more woody, thicker, and more laxly branched. Leaves usually crowded, narrow-oblong, about three-times as long as wide, usually slightly widened to the tip, concave above, 0.6—0.8 cm. long, 0.2—0.4 cm. wide. Styles most often 5.

The type is *Adamson* 5249A (BOL).

S.W. AFRICA. Rehoboth v. *Rhyn* (PRE); Usakos *Marloth* 1297 (BOL, PRE); Bullpoort *Liebenberg* 5105 (K, PRE).

CALVINIA. De Bosch *Adamson* 4554, 4556.

PRIESKA. Prieska *Bryant* 231 (K), J231 (PRE), s.n. (PRE).

BEAUFORT WEST. Rd. to Aberdeen *Adamson* 5249A.

NB.—A specimen from Richmond, van Wyks Oplag, *Gill* 54 (PRE) probably belongs to *G. papulosa*. It differs in having a reddish woody stem and gray leaves, very slightly succulent and finely papulose.

18. *G. sarcophylla* Fenzl in Sond. Fl. Cap. 2. 475. 1862.

A low-growing more or less sprawling plant in clumps up to 30 cm. high and 50 cm. across, the whole glistening, grayish-green or the older parts red or yellow. Stems many, decumbent with ascending branches, the oldest slightly woody, the younger coarsely papulose and covered with loosely appressed hair-like scales. Leaves succulent, coarsely papulose and with scales at least when young, alternate or the lowest opposite, obovate-spatulate, obtuse, the lower 0.6—1.6 cm. long, 0.3—0.8 cm. wide, narrowed to a petiole at the base, the upper leaves smaller, sessile. Flowers on close or distant secund lateral branches, usually numerous. Bracts thick, obtuse, longer than the flowers; bracteoles about about as thick as long, as long as the flowers. Perianth segments 5, about 2 mm. long, not succulent, covered with scales on the back. Anthers yellow, less often pink. Styles 3, occasionally 5, rarely 2 by reduction.

The type is *Zeyher* 719 (B), lectotype (S).

Sand or gravel especially in river beds in the karroo.

Readily distinguished by the papulose succulent leaves with few or many hair-like scales on the younger parts, and the flowers crowded on lateral branches.

S.W. AFRICA. Swakopmund *Moss* 18014 (BM); *Pearson* 529 (SAM); *Rogers* (BOL), *Wiss* 965 (PRE); *Luderitz Kinges* 2458 (PRE); *Ababies Pearson* 9126 (BOL, K); *Noachabib Pearson* 8673 (BOL); *Namalong Marloth* 1532 (PRE); *Schinz* 916 (K); *Gt. Karasberg Pearson* 8574 (BOL, K), 8673 (BOL, K); *Kl. Karasberg Dinter* 4853 (BOL, K, PRE); *Bakhuis Pearson* 5448 (K).

NAMAQUALAND. Steinkopf *Schlechter* 38 (BOL, K, PRE), s.n. (BM); Nieuwfontein *Pearson* 3356 (BOL, K, SAM); Orange River *Pearson* 6027 (SAM); Concordia *Schlechter* 11327 (BOL, PRE); Okiep *Dümmer* (K); Springbok *Lewis* (SAM); *Zeyher* 719 (BM, BOL, CGE, GRA, K, S; SAM); Sabatsfontein *Lewis* (SAM); Hendeklip Bay *Pillans* (BOL); Bitterfontein *Adamson* 4991; *Zeyher* (SAM).

VAN RHYNSDORP. Nieuwerust *Adamson* 4895; Scharkraal *Pearson* 3074 (BOL, K); Klaver *Lavis* (BOL); *Lewis* (SAM); Widouw Riv. *Stokoe* (SAM).

CLANWILLIAM. Pakhuis *Adamson* 4514; Bidouw *Johnson* 547 (NBG); Matjes Riv. *Wagner* 146 (NBG); Buchufontein *Lewis* (SAM).

GORDONIA. Upington *Webb* 5 (K).

KENHARDT. Kakamas *Acocks* (PRE); *Lewis* (SAM); Aughrabies Falls *Wasserfall* 1037 (PRE).

CALVINIA. Loeriesfontein *Adamson* 2047; Granaatboskalk *Comins* 674 (PRE); Calvinia *Schmidt* 397 (PRE); Ekerdam *L. E. Taylor* 2734 (NBG); Botterkloof *Adamson* 5077; de Bosch *Adamson* 5084—5; Commando Doorns *Adamson* 5083.

PRIESKA. Prieska *Bryant* (BOL); *Page* (BOL).

WILLISTON. Rietkolkoos *Acocks* 9616 (PRE); Dwaar Riv. *Burchell* 1457 (K).

FRASERBURG. Fraserburg *Hafstrom & Acocks* 422, 2296 (PRE).

SUTHERLAND. Both Middelpost & Sutherland *Hutchinson* 717 (BOL, K, PRE).

BEAUFORT WEST. Krom Riv. *Goatcher* (BOL); Klipbrak *Rogers* 17118 (PRE); Sunnyside *Esterhuysen* 2741 (BOL, NBG, PRE); rd. to Aberdeen *Adamson* 5249.

RICHMOND. Gt. Tafelberg *Acocks* 8734 (PRE).

MURRAYSBURG. Murraysburg *Tyson* 431 (BM, BOL, K, SAM).

MIDDELBURG. Middelburg *Theron* 221 (PRE).

CRADOCK. Cradock *Brynard* 274 (K, PRE).

GRAAF REINET. Graaf Reinet *Bolus* 2314 (BOL).

ABERDEEN. Groot Riv. *Hutchinson* 3136a (K).

LAINGSBURG. Whitehill *Compton* 11196 (NBG); Matjesfontein *Foley* 1657 (K).

MONTAGU. Koo *Adamson* 5103.

UNIONDALE. Rd. to Willowmore *Fourcade* 4658 (BOL, K); *Pole Evans* 2286 (PRE).

KNYSNA. Vlugt *Bolus* 2314a (BOL).

FAURESMITH. Lückhoff *Pole Evans* 1881—2 (PRE); *C. A. Smith* 483, 485 (PRE); Veld Res. *Henrici* 4707 (PRE); Groenvlei *Verdoorn* 1034 (PRE) Van Wyksbrak *C. A. Smith* (PRE); Pampoenpoort *Henrici* 4761 (PRE).

KOFFIEFONTEIN. Poortjesdam *Henrici* 4503 (PRE).

BLOEMFONTEIN. Bloemfontein *Henrici* 2736 (PRE).

Without locality:—*Drege* 7060 (K); *Rogers* 205 (BOL).

19. *G. portulacacea* Fenzl in Sond. Fl. Cap. 2. 475. 1862.

A gray-green diffuse or sprawling plant with the shoots ascending. Stems herbaceous or woody at the base only, 15—30 cm. long, the younger covered with loosely appressed white hair-like scales. Leaves opposite except in the flowering region, oblong or oblong-spatulate, 1—3 cm. long, 0.3×0.6 cm. wide, much narrowed to the base, subacute at the tip, flat, not succulent, papulose, covered with loose hair-like scales when young. Flowers in lax terminal cymes, in groups of 5—7, the lateral on branchlets 0.5—1.5 cm. long. Bracts like the leaves but much narrower and usually folded upwards. Perianth segments 5, about 3 mm. long, erect, the tips incurved, green outside. Anthers yellow. Styles 3 or 5.

The type is *Drege* (Dreikoppen) (B).

On sand at or near the margins of the karoo.

In appearance somewhat like *G. sarcophylla* but not succulent and with larger leaves. In collections it has been much confused with *G. pubescens* but is distinguished by the opposite narrower leaves with loose hair-like scales and the lax inflorescence. Sonder l.c. uses three different spellings for the specific epithet, the others being "*portulacea*" and "*portulacoides*".

KIMBERLEY. Alexandersfontein *Power* (PRE).

CALVINIA. Nieuwoudtville *Lavis* (BOL).

NAMAQUALAND. Hondeklip Bay *Pillans* (BOL).

CLANWILLIAM. Graafwater *Adamson* 4402.

CERES. Karroo Poort *Adamson* 5087; *Compton* 3502 (BOL).

WORCESTER. Brandvlei v. *Breda* 316 (PRE).

ROBERTSON. Robertson Karroo *Adamson* 5154; *Levy* 4321 (CT).

SWELLENDAAM. Bonnievale *Compton* 3422 (BOL).

MONTAGU. Kogmans Kloof *Adamson* 4645.

RIVERSDALE. N. side Garcias Pass *Adamson* 4596; Riversdale *Story* 2878 (PRE); Muiskraal *Adamson* 5149.

MOSSSEL BAY. Gouritz Riv. *Schlechter* 5719 (PRE).

GRAAF REINET. Graaf Reinet *Bolus* 116 (BOL, GRA).

20. **G. squamulosum** (E. & Z.) Fenzl in Sond. Fl. Cap. 2. 477. 1862.
Aizoon squamulosum E. & Z. 326. 1837.

A white or less commonly yellow decumbent or prostrate plant covered all over with flat spreading scales. Stems 20—50 cm. long, slightly woody at the base, with erect or ascending branches. Leaves opposite or alternate in the flowering region, somewhat succulent, coarsely papulose, oblong or obovate, 1—2 cm. long, 0·3—0·7 cm. wide, obtuse, narrowed to the base, usually rolled upwards. Flowers sessile, solitary. Bracts leaf-like. Perianth segments 5, 2 mm. long, densely covered with scales outside, yellow inside. Anthers yellow. Styles 2.

The type is *Ecklon & Zeyher* 2136 (S).

In damp brackish hollows and stream beds in the western and north-western karoo.

Distinguished by the dense covering of scales. Like *G. sarcophylla* but larger, prostrate, much more scale-covered, and with 2 carpels.

S.W. AFRICA. Swakop Riv. *Galpin* 7467 (PRE); *Galpin & Pearson* 7466 (K, SAM); Swakopmund *Pearson* 5317 (K, SAM); Stomprietfontein *Loeb* XI (PRE); Bucholtzkram *Pearson* 3385 (BOL, K); Windhoek *Rogers* 29768 (GRA, K); *v. Niekerk* 330 (BOL); Aus *Dinter* 6113 (BOL, K).

NAMAQUALAND. Witbank *Pillans* 5555 (BOL); Orange Riv. *Ecklon & Zeyher* 8136 (S, SAM); Eenkokerboom *Schlechter* 11065 (BM, BOL, GRA, K, PRE); *Garies Adamson* 5015.

GORDONIA. Upington *Broom* (GRA); *Webb* 5, 11 (PRE).

VICTORIA WEST. Pampoenpoort *Acocks* 14678 (PRE).

21. **G. fruticosa** (L.f.) Sond. Fl. Cap. 2. 477. 1862.

Aizoon fruticosum L.f. Supp. Pl. 261. 1781.

A whitish diffuse woody shrublet with rigid usually secund branches up to 50 cm. long. Stems yellowish, thinly covered with appressed hairs, the internodes 1—4 cm. long. Leaves opposite, gray or almost white, densely covered with silky appressed hairs, oblong or obovate, usually folded upwards, 0·5—1·5 cm. long, 0·3—0·5 cm. wide, acute or subacute with a hooked point. Inflorescence rigid, forking at the base, above with divaricate alternate usually secund branches. Flowers on short branchlets usually separated. Bracts leaf-like, longer than or as long as the flowers. Perianth segments 4, about 1 mm. long, erect, hairy outside either all over or at the tip only. Anthers red or yellow. Styles 2.

The type is in herb. Thunb. Uppsala.

Open Karoo on shales.

Distinguished by the rigid woody habit, leaves covered with silky hairs and the small flowers. Variable in size and the extent and branching of the inflorescence which is either secund or almost erect. After flowering

the inflorescence branches harden and may become spinous. The bracts vary from leaf-like to very small and not longer than the flowers. Forms with red and with yellow flowers are found side by side without any other difference. The leaves are finely papulose but this is hidden by the hairs.

S.W. AFRICA. Kl. Karasberg *Dinter* 4951 (BOL, K, PRE); *Galpin* 14200 (BOL, PRE).

NAMAQUALAND. Port Nolloth *Galpin & Pearson* 1671 (BOL); Okiep *Scully* (SAM); Hondeklip Bay *Adamson* 5007, 50341 *Pillans* (BOL); Bitterfontein *Esterhuysen* 1296 (PRE); *Godman* 48 (BM); *Zeyher* 723 (K, S).

VAN RHYNSDORP. Nieuwerust *Adamson* 4978, 4987, 4990; Van Rhynsdorp *Adamson* 4537, 4540; *Maguire* 143 (NBG); Klaver *Adamson* 4532, 4534, 4968, 4970, 4521 *Maguire* 138 (NBG); Nardouw *Stokoe* (SAM); Knechtsvlakte *Compton* 15095, 20870 (NBG); Ebenezer *Drege* (S).

CALVINIA. *Calvinia Henrici* 3395—6 (PRE); Commando Doorns *Adamson* 5086 Bushmanland *Pearson* 6221 (K).

CLANWILLIAM. Clanwilliam *Levy's* 1261 (CT); Olifants Riv. *Zeyher* (SAM).

PIKETBERG. Eendekuil *Howes* 187 (K, PRE); Het Kruis *Stephens & Glover* 8726 (BM, BOL, K).

CERES. Beukiesfontein *Adamson* 5086.

WORCESTER. Hex Riv. *Liebenberg* 4198 (PRE); Marloth 3751 (BOL).

LAINGSBURG. Koup *Esterhuysen* 4508 (BOL); Whitehill *Compton* 2932 (BOL, K), 3540 (BM, BOL, K).

ABERDEEN. Aberdeen *Maguire* 754 (NBG); van Wyksbos *Theron* 906 (K, PRE).

BEAUFORT WEST. Beaufort West *Acoccks* 14303 (PRE); *Pole Evans* 31 (PRE).

MONTAGU. Kiesies Doorns *Michell* 262 (PRE).

ROBERTSON. Robertson Karroo *Adamson* 4650, 4652—4, 4661, 4662, 4664.

Without locality:—*Drege (Tephros pubescens)* (K); *Masson* (BM).

Var. *prostrata* Adamson var. nov.

A typo differt caulibus lignosis prostratis, foliis papulosis paucipilosis, floribus numerosis in ramis secundis divaricatis congestis.

Woody, quite prostrate, the branches secund. Leaves papulose, rather thinly hairy, not over 1·2 cm. long. Inflorescence with many secund alternate branches and numerous branchlets 0·3—0·7 cm. long. Flowers crowded. Bracts longer than the flowers, partly reflexed. Perianth segments 1·5 mm. long. Anthers orange-yellow.

The type is *Salter* 7012 (K).

Distinctive in habit, papulose leaves, and very crowded flowers.

CAPE. Viissershock *Salter* 7012 (BOL, K).

22. *G. crystallina* (E. & Z.) Fenzl in Sond. Fl. Cap. 2: 477. 1862.

Aizoon crystallinum E. & Z. Enum. 327. 1837.

G. namaquensis Schellenb. & Schltr. Bot. Jahrb. 48. 500. 1913.

G. leucoclada Schellenb. & Schltr. l.c. (p.pte.).

A gray diffuse shrublet with spreading secund branches, 20—40 cm. long. Stems woody at the base but not rigid. Young stems and leaves more or less densely covered with coarse hairs or hair-like scales, spreading or loosely appressed. Leaves opposite or alternate in the flowering region, coarsely papulose, oblanceolate, oblong or spatulate, most often folded upwards, 0.5—1.7 cm. long, 0.3—0.6 cm. wide, usually obtuse. Inflorescence secund, most often lax, forking, with many alternate lateral branches bearing the flowers in groups. Bracts leaf-like, much longer than the flowers; bracteoles about as long as the flowers. Perianth segments 4 or 5, about 2 mm. long, papulose and often hairy outside, incurved at the tip, yellow or pink inside. Anthers orange-yellow or pink. Styles 2.

The type is *E. & Z.* 2138 (W), lectotype (SAM).

Rocky or stony soils in the western and southern parts of the Karoo. Like *G. fruticosa* but less rigid, with prominently papulose leaves and a laxer more secund inflorescence with leaf-like bracts. Very variable in habit, in the amount of hair covering, in the shape of the leaves, and in flower colour. While extreme forms look very distinct and some have been described as species, they all appear to be connected by intermediates. The type specimen is a semi-herbaceous form with rather thick semi-succulent leaves covered with narrow scales. This form appears to be rare and confined to Namaqualand. More woody forms are much more common: those with distinctly hairy stems and leaves have been described as *G. namaquensis* Schellenb. & Schltr. (type *Schlechter* 11290). Glabrescent woody forms have been attributed to *G. leucoclada* Schellenb. & Schltr. The type of this species, *Schlechter* 11279, belongs to *G. pruinosa*, but some of the quoted specimens, e.g. *Bolus* 9532, undoubtedly belong here. There seems no constant difference between forms with 4-merous and 5-merous flowers, indeed both have been found on the same plant. Red or yellow coloration of the perianth and anthers also seems to have no diagnostic value.

NAMAQUALAND. Port Nolloth *Bolus* 9532 (BOL), s.n. (BOL) *Galpin & Pearson* 7487 (K); *Pillans* 5198 (BOL); Okiep *Bolus* 9532 (K); *L. Bolus* (BOL); *Scully* (SAM); Messklip *Schlechter* 11290 (BM, GRA, K, PRE); Arakup *Schlechter* 11240 (BM, BOL, K, PRE); Kastel Poort

Bolus 9532 (BOL, K); Copperberg *Pillans* 5158 (BOL); Lekkersing *L. E. Taylor* 1104 (BOL); Witbank *Pillans* 5555 (BOL); Wallekraal *Adamson* 5043, 5045, 5047, 5019: *Pillans* (BOL); Garies *Adamson* 5013; Kamiesberg *Esterhuysen* 1358 (BOL, PRE); s.l. *Scully* 258 (BM).

CALVINIA. Loeriesfontein *Pearson* 4855 (BOL, K, PRE).

VAN RHYNSDORP. Widouw Riv. *Lewis* (BOL); *Maguire* 135 (BOL); *Stokoe* (SAM) Klaver *Lamb* 3642 (SAM); *Stokoe* (SAM); Van Rhynsdorp *Adamson* 4544; *Lewis* (SAM); *Thode* A1896 (PRE); Knechtsvlakke *Schlechter* 8313 (BM, BOL, K).

CLANWILLIAM. Zout Riv. *Schlechter* 8103 (BOL), 8107 (BM); Valleyfontein *Ecklon & Zeyher* 2138 (SAM).

WORCESTER. Worcester v. *Breda* 112 (PRE).

PIKETBERG. Piketberg *Adamson* 4478.

HOPEFIELD. Hopefield *Letty* 130 (PRE).

MONTAGU. Rd. to Barrydale *Adamson* 5109.

UITENHAGE. Uitenhage *Prior* (K).

Without locality:—*Drege* (*G. salsoloides* Fenzl) (S); *Verreaux* (S).

Var. **maritima** Adamson var. nov.

A type differt caulibus prostratis ramulis erectis subherbaceis, foliis longioribus albis oblanceolatis, floribus in ramulis congestis.

A white prostrate plant. Main stems woody, up to 60 cm. long, branched with numerous erect or ascending almost herbaceous branchlets. Leaves opposite, oblanceolate, 0.5—2 cm. long, flat or folded upwards, gradually narrowed to the base, covered with coarse appressed hairs. Flowers rather crowded on the lateral branches. Bracts leaf-like, longer than the flowers. Perianth segments 5, 1.5 mm. long, erect, hairy on the back. Styles 2, erect, as long as the perianth.

The type is *Wolley-Dod* 3127 (BOL).

Damp hollows in silt near the sea.

CLANWILLIAM. Lamberts Bay *Adamson* 4485; Bidouwberg *Lewis* (BOL).

CAPE. Paarden Is. *Adamson* 1943, 3117 (CT), 3400 (SAM); *Wolley-Dod* 3127 (BM, BOL, K); *Levyns* 5156 (CT).

Without locality:—*Drege* (*G. sericea* a) (S); *Verreaux* (S).

23. **G. fallax** Pax in Engler Pflzw. Afrik. 3.1. 47. fig. 94 J-L. 1915.

A gray-white erect rounded shrublet. Stems stout, branched from the base, 15—30 cm. high, pinkish, the younger papulose, the older pruinose. Leaves opposite, succulent, narrow oblong, rolled upwards, 1—2.5 cm. long, more or less hooked at the tip, papulose or slightly scaly when young, pruinose when old. Flowers in a crowded terminal

panicle. Bracts thick, slightly longer than the flowers: bracteoles as thick as long. Perianth segments 4, about 2 mm. long, the outer thick, cucullate, papulose on the back with hairs at the tip, the inner thinner, with hair-scales at the tip. Styles 2, erect.

Sandy or rocky river beds in S.W. Africa.

Perianth segments very slightly joined at the base. The type of this species has not been seen. It is identified from the somewhat inadequate description and excellent figures.

S.W. AFRICA. Walfisch Bay *MacOwan* s.n. (BOL); Swakop Riv. *Galpin & Pearson* 7466 (SAM); Luderitz *Hobart-Hampden* (BM); *Kinges* 2054 (PRE); *Moss* 23 (BM), 17883 (BM); s.l. *Marloth* 4616 (PRE); *Rogers* s.n. (BOL).

NAMAQUALAND. Port Nolloth *Galpin & Pearson* 7489 (SAM).

24. *G. pruinosa* Sond. Fl. Cap. 2. 477. 1862.

G. leucoclada Schellenb. & Schltr. Bot. Jahrb. 48. 500. 1913 p.ptc.

A gray or white diffuse or suberect shrublet up to 50 cm. high. Stems white, papulose or with appressed scales when young, glabrescent when older, much branched, the branches opposite, ascending or divaricate. Leaves opposite, wedge-shaped or obovate-spatulate, obtuse, coarsely papulose, 0.5—1.5 cm. long, 0.3—0.6 cm. wide, the youngest with appressed hair-like scales, the older glabrescent. Inflorescence forking, the branches with internodes 4—8 cm. long in the lower part, in the distal part with alternate lateral branchlets, 2—5 cm. long. Flowers lax or in groups, the groups often dense but separated 0.5—1 cm. Bracts ovate, 2—4 mm. long; bracteoles very small. Perianth segments usually 5, about 2 mm. long, papulose and with appressed scales outside, the tips incurved. Anthers yellow. Styles 2 or occasionally 3, thick, spreading.

The type is *Drege* (Gariep) (W), lectotype (S).

Rocky places in the N.W. Cape.

A distinctive species readily known by the white woody stems and forking pedunculate inflorescences. The plants distributed by Dinter under the name "*G. leucodermis*" only differ in having more succulent leaves and shorter more compact inflorescences. They cannot be considered as distinct. The type specimen of *G. leucoclada* (*Schlechter* 11279) is this species.

S.W. AFRICA. Angra Paquena *Galpin & Pearson* 7512 (K); Aus *Dinter* 6164 (BM, BOL, K); Achterfontein *Pearson* 9228 (BOL).

NAMAQUALAND. Orange Riv. *Drege* (S); Port Nolloth *Pearson* 514 (K); Groot Derm *Pillans* 5332 (BOL, K), 5595 (BOL); Messklip *Schlechter* 11279 (BM, K, PRE).

CLANWILLIAM. Wolverson *Schlechter* 11441 (BM, GRA).

PIKETBERG. Eendekuil *Levy's* 1683 (CT).

Without locality:—*Drege* (*Tephros papulosa* EM c) (CGE).

25. *G. hemisphaerica* Adamson sp. nov.

Fruticulus ramosissimus hemisphaericus ramis subdivaricatis dichotomis. Folia opposita vel superiores alterna, subcarnosa obtusa papulosa, vetera decidua. Flores laxe dichotomo-cymosa. Perigonii segmenta 5. Styli 2 raro 3.

A hemispherical shrublet, 20—25 cm. high, 30—50 cm. diam. Stems woody, pale brown, much branched, the branches almost divaricate and forking. Young stems papulose, the older smooth, glabrous. Leaves opposite, soon deciduous, slightly succulent, flat, obtuse, wedge-shaped, papulose, 0.8—1.5 cm. long, 0.2—0.4 cm. wide. Inflorescence terminal, di- or tri-axial, lax, elongated. Bracts like the leaves but much shorter; bracteoles not longer than the flowers. Perianth segments 5, 1.5—2 mm. long, almost flat, papulose outside. Styles 2, rather thick, rarely 3.

The type is *Dinter* 6440 (BOL).

Dry open places on sand.

The whole plant rolls in the wind when dry. Allied to *G. pruinosa* but distinct in habit and the inflorescence.

S.W. AFRICA. Buchenberg *Dinter* 6440 (BOL); Aus *Dinter* 3681 (BM, BOL, K).

NAMAQUALAND. Steinkopf *E. P. Phillips* 1637 (SAM).

26. *G. cymosa* Adamson sp. nov.

Suffrutex diffusa subsecunda ramis oppositis subdivaricatis. Folia subglabra spatulata vel obovata petiolata papulosa. Panicula secunda laxe cymosa ramis subdivaricatis internodiis longis. Perigonii segmenta 4 vel 5. Styli 4 vel 5, raro 3, longi tenues.

A diffuse branching shrublet up to 50 cm. high, the branches secund, opposite, often divaricate. Young parts with a few appressed hair-like scales, the older glabrescent. Leaves opposite or the upper alternate darkish green, broadly spatulate or obovate, obtuse, petiolate, 0.5—2 cm. long, 0.4—0.6 cm. wide, finely papulose. Inflorescence a secund panicle, the lower internodes 1—2.5 cm. long, the branches widely forking, the ultimate alternate. Bracts leaf-like but sessile, not longer than the flowers, often falcate-recurved. Perianth segments 5, less often 4, 2—3 mm. long, green and papulose on the back. Anthers yellow, Styles 5 or 4, rarely 3, very slender as long as the perianth.

The type is *Adamson* 5135 (BOL).

Rather sheltered places among rocks in the southern parts of the karoo, especially near the margins.

Allied to *G. pruinosa* but less woody, more slender, the stems not white, the leaves thinner and petiolate, and the inflorescence secund and laxer, also with 4 or 5 styles.

LAINGSBURG. Whitehill *Compton* 2923 (BOL, K), 3176 (BOL), 3596 (BOL, NBG, K), 3605 (BOL, NBG): Matjesfontein *Foley* 159 (PRE).

PRINCE ALBERT. Prince Albert *Bolus* 11514 (BOL, K).

LADISMITH. Warm Baths *Adamson* 4618: Warmwaterberg *Adamson* 5125, 5127, 5133, 5135.

HEIDELBERG. Lemoenshoek *Adamson* 5142—3.

MONTAGU. Rd. to Barrydale *Levyns* 424 (CT).

RIVERSDALE. Waterval *Muir* 3753 (PRE).

GEORGE. Olifants Riv. *Bolus* 2316 (BOL, K).

ALBANY. Cradock Rd. *Dyer* 2124 (GRA, K).

FT. BEAUFORT. Ft. Beaufort *Ecklon & Zeyher* (GRA).

27. *G. Dregeana* Fenzl in Sond. Fl. Cap. 2. 477. 1862.

A stout rigid whitish woody shrublet up to 45 cm. high. Stems white, covered all over with large projecting papillae, on the young parts sometimes flattened as scales. Branches opposite, ascending or divaricate. Leaves opposite, whitish, almost orbicular, thick petiolate, coarsely papulose, obtuse, the blades 0·7—1·5 cm. long, 0·7—1·3 cm. wide, the petioles about 2 mm. long. Flowers in a terminal crowded flat-topped panicle. Bracts like the leaves but much smaller, the uppermost about as long as the flowers. Perianth segments 5, 3—4 mm. long, densely papulose outside, the three outer segments cucullate, the two inner flat, obtuse or emarginate, all membranous edged. Anther deep orange or pink. Styles 2, rather long.

The type is *Drege* (Gariep) (B), lectotype (S).

Dry river banks in Namaqualand.

A very distinctive species easily recognised by the orbicular leaves, densely papillate stem, and large flowers.

S.W. AFRICA. Khamstal *Dinter* 8173 (K).

NAMAQUALAND. Verleptpram *Drege* (S); Bushmans Riv. *Pillans* 5063 (BOL), 5387 (BOL); Koodoes Riv. *Pillans* 5529 (BOL); de Koei *Leighton* 2411 (BOL); Hells Kloof *Compton* 18862 (NBG).

LIST OF NUMBERED SPECIMENS QUOTED.

ACOCKS. 64 *exigua*; 524 *collina*; 1630 *prostrata*; 1900 *exigua*; 2233 *pubescens* v. *cerosa*; 2600 *procumbens*; 4867 *subcarnosa*; 8540 *procumbens*; 8734 *sarcophylla*; 9027a *pubescens*; 9616 *sarcophylla*; 9618 *secunda*; 9716 *papulosa*; 11093 *pubescens*; 11959 *procumbens*; 12650 *secunda*; 12789 *pubescens*; 13209 *africana*; 13224 *procumbens*; 14303 *fruticosa*; 14347 *exigua*; 14358 *subcarnosa*; 14359 *secunda*; 14678 *squamulosa*; 14721 *affinis*; 15934 *subcarnosa*; 15841 *pubescens*; 15944 *secunda*; 16559 *prostrata*; 16890 *subcarnosa*.

- ADAMSON. 1448 *herniariaefolia*; 1827 *secunda*; 1943 *crystallina* v. *maritima*; 2047 *sarcophylla*; 2055 *herniariaefolia*; 2083 *africana*; 2691, 3096 *secunda*; 3117 *crystallina*; 3133 *filiformis*; 3159 *pubescens*; 3212 *pubescens*; 3400 *crystallina* v. *maritima*; 3544 *pubescens*; 3764 *filiformis*; 3932 *secunda*; 4402 *portulacacea*; 4412 *filiformis*; 4462, 4466 *secunda*; 4478, 4485 *crystallina*; 4514 *sarcophylla*; 4521 *fruticosa*; 4531 *crystallina*; 4532, 4534, 4537, 4540 *fruticosa*; 4543, 4544 *crystallina*; 4545 *collina*; 4552 *africana*; 4554, 4556 *papulosa* v. *microphylla*; 4555 *papulosa*; 4556 *crystallina*; 4574, 4575, 4576, 4577, 4579, 4580, 4885 *filiformis*; 4586a *herniariaefolia*; 4590 *papulosa*; 4598 *portulacacea*; 4604 *secunda*; 4606, 4607 *pubescens*; 4609 *filiformis*; 4616 *pubescens*; 4618 *pruinosa*; 4622, 4623, 4624, 4625, 4626, 4628 *papulosa*; 4640, 4642 *cymosa*; 4645 *portulacacea*; 4650 *fruticosa*; 4651 *secunda*; 4652, 4654, 4658, 4661, 4662, 4664, 4665 *fruticosa*; 4728 *africana*; 4755 *secunda*; 4756 *herniariaefolia*; 4762 *secunda*; 4763 *pubescens*; 4817 *herniariaefolia*; 4848 *filiformis*; 4836 *collina*; 4893 *papulosa*; 4929 *pubescens*; 4931 *secunda*; 4968, 4970 *fruticosa*; 4977 *collina*; 4978 *fruticosa*; 4985 *sarcophylla*; 4986 *collina*; 4987 *fruticosa*; 4989 *collina*; 4990 *fruticosa*; 4991 *sarcophylla*; 5007 *fruticosa*; 5013 *crystallina*; 5014 *secunda*; 5019 *crystallina*; 5023 *collina*; 5034 *fruticosa*; 5041 *collina*; 5043, 5045, 5046, 5047 *crystallina*; 5048 *collina*; 5049, 5051 *crystallina*; 5077 *sarcophylla*; 5076, 5080 *crystallina*; 5083, 5084, 5085 *sarcophylla*; 5086 *fruticosa*; 5087 *portulacacea*; 5096 *filiformis*; 5097 *secunda*; 5102 *filiformis*; 5103 *sarcophylla*; 5107 *collina*; 5109 *crystallina*; 5225, 5127 *cymosa*; 5129 *papulosa*; 5133, 5135, 5142, 5143 *cymosa*; 5146, 5147, 5148 *africana*; 5149 *portulacacea*; 5154 *portulacacea*; 5178 *herniariaefolia*; 5179 *collina*; 5188, 5199 *africana* x *procumbens*; 5206, 5207, 5208 *procumbens*; 5209, 5210 *prostrata*; 5212, 5214 *secunda*; 5234, 5235, 5236 *africana*; 5227 *procumbens*; 5239 *africana*; 5240, 5241, 5243, 5246 *rigida*; 5244, 5245 *africana*; 5246 *procumbens*; 5249 *sarcophylla*; 5249A *papulosa* v. *microphylla*; 5250, 5251 *procumbens*; 5252, 5259 *pubescens*; 5260, 5261, 5262, 5263, 5264, 5269, 5271, 5272 *pubescens*; 5272 *secunda*; 5275 *pubescens*.
- BAKKER. 237 *africana*.
- BARKER. 104 *procumbens*; 6748 *collina*.
- BARNARD. 759 *secunda*; 774 *africana*.
- BAUER. 1098 *pubescens*.
- BELCK. 15 *papulosa*.
- BOLUS. 28 *papulosa*; 116 *portulacacea*; 182 *procumbens*; 1866 *secunda*; 2314, 2314a *sarcophylla*; 2313, 2315 *africana*; 2316 *cymosa*; 2741 *africana*; 4631 *herniariaefolia*; 5055 *africana*; 6815 *prostrata*; 7545 *hispidissima*; 7546 *Ecklonis*; 9218, 9268 *secunda*; 9532 *crystallina*; 11514 *cymosa*; 11515 *papulosa*; 11915 *secunda*.
- BRADFIELD. 450 *namaensis*.
- BRITTEN. 789 *pubescens*; 647 *africana*; 1906 *secunda*; 5499 *secunda*.
- BROCK. 16 *pubescens*.
- BRUECKNER. 944 *secunda*; 962 *prostrata*.
- BRYANT. 115 *africana* v. *secundata*; J115, J116 *namaensis*; J128 *crystallina*; J231 *papulosa* v. *microphylla*; 377 *sarcophylla*; 1151a *secunda*; 1151b *prostrata*; 1153 *sarcophylla*.
- BRYNARD. 154 *procumbens*; 274 *sarcophylla*; 275, 231 *pubescens*.
- BURCHELL. 1251 *pubescens*; 1457 *sarcophylla*; 1613 *namaensis*; 1764 *namaensis*; 2551, 2594 *filiformis*; 3913 *secunda*; 6389 *secunda*; 6414 *africana*; 6417 *filiformis*; 6419 *pubescens*; 6498 *affinis*.
- BURTT-DAVY. 1495, 1537 *pubescens*; 7566 *procumbens*; 7862 *pubescens*; 11959 *secunda*; 12648 *papulosa*; 3108 *pubescens* v. *lignosa*; 17560 *procumbens*.
- CASTELNAU. 65 *africana*.
- CODD. 3425 *exigua*; 5809 *namaensis*.
- COMINS. 674 *sarcophylla*; 710 *procumbens*.
- COMPTON. 2923 *cymosa*; 2932 *fruticosa*; 3063 *filiformis*; 3176 *cymosa*; 3422 *portulacacea*; 3540 *fruticosa*; 3596 *cymosa*; 3604 *secunda*; 3605 *cymosa*; 3802 *portulacacea*; 5735 *pubescens*; 7356, 9296, 10403 *papulosa*; 11196 *sarcophylla*; 12079 *secunda*; 11239 *papulosa*; 12604 *africana*; 13056 *herniariaefolia*; 13253 *Ecklonis*; 15094 *secunda*; 15095 *fruticosa*; 15233, 17407 *secunda*; 18862 *Dregeana*; 19062 *pubescens*; 20304 *secunda*; 20870 *fruticosa*; 21084, 22615 *pubescens*; 22914 *Ecklonis*.
- CONVENT. 29 *pubescens*.

- COOPER. 7 *pubescens*; 518 *pubescens*; 1281 *secunda*.
 CROSS. 48 *secunda*.
 CRUDEN. 93 *pubescens*; 141, 471, 483, 484 *secunda*.
 DINTER. 348 *papulosa*; 3681 *hemisphaerica*; 3936 *secunda*; 4154 *collina* 4853 *sarcophylla*; 4888 *africana*; 4951 *fruticosa*; 6094 *collina* v. *Meziana*; 6113 *squamulosa*; 6164 *pruinosa*; 6239 *papulosa*; 6440 *hemisphaerica*; 8173 *Dregeana*.
 DREGE. 571b *pubescens*; 7060 *sarcophylla*; 7061a *secunda*.
 DREGE, J. F. 3011 *pubescens*.
 DUTHIE. 1908 *Ecklonis*.
 DYER. 634 *pubescens*; 1027 *procumbens*; 1680 *secunda*; 1906 *procumbens*; 2124 *cymosa*.
 ECKLON. 2149 *Ecklonis*.
 ECKLON & ZEYHER. (83) *africana*; 188 *pubescens*; 189 *secunda*; 309 *africana*; 2131, 2132 *secunda*; 2133 *pubescens*; 2134 *secunda*; 2136 *squamulosa*; 2137 *papulosa*; 2138 *crystallina*; 2139 *affinis*; 2142 *herniariaefolia*; 2143 *collina*; 2144, 2145 *pubescens* v. *pollens*; 4821 *herniariaefolia*.
 EDWARDS. 171 *hispidissima*.
 ESTERHUYSEN. 811 *pubescens* v. *cerosa*; 812 *pubescens*; 813, 814 *acutifolia*; 821 *pubescens*; 1296 *fruticosa*; 1331 *collina* v. *Meziana*; 1356, 1358 *crystallina*; 2319 *pubescens*; 2739 *procumbens*; 2741 *sarcophylla*; 4001 *africana*; 4225 *exigua*; 4412, 4449 *filiformis*; 4454 *secunda*; 4455 *filiformis*; 4518 *fruticosa*; 4509 *papulosa*; 5150 *pubescens*; 6054 *Ecklonis*; 19556 *pubescens*.
 FENCHAL. 171 *namaensis*.
 FLANAGAN. 119 *pubescens*; 1382, 1404 *procumbens*; 1480 *prostrata*; 1694 *secunda*; 1657 *africana*; 1661 *secunda*.
 FOLEY. 4 *africana*; 159 *cymosa*; 1657 *sarcophylla*.
 FOURCADE. 1661 *secunda*; 2578, 2782 *pubescens*; 4286 *africana*; 4654 *papulosa*; 4658, 4660a *pubescens* v. *Fourcadei*; 5677 *papulosa*; 6061 *pubescens*; 6460 *pubescens* v. *Fourcadei*.
 FRIES, NORLINDH & WEIMARCK. 736 *papulosa*; 781 *pubescens*; 1517 *filiformis*.
 GALPIN. 1837 *pubescens*; 1941 *prostrata*; 4073 *papulosa*; 4074, 4075 *africana*; 5644 *pubescens*; 5476 *prostrata*; 5977 *procumbens*; 5978 *prostrata*; 14129 *africana* v. *secundata*; 14200 *fruticosa*; 7467 *squamulosa*; 7680 *procumbens*.
 GALPIN & PEARSON. 1671 *fruticosa*; 7466 *squamulosa*; 7512 *pruinosa*; 7466 *fallax*; 7467 *sarcophylla*; 7480 *africana* x *namaensis*; 7487 *crystallina*; 7489 *fallax*.
 GERSTNER. 6332 *crystallina*; 6397 *namaensis*.
 GIBBS. 12 *subcarnosa*.
 GILL. 32 *procumbens*; 54 *papulosa*; 82 *procumbens*.
 GODMAN. 618 *fruticosa*.
 GUTHRIE. 766 *herniariaefolia*; 2607 *hispidissima*; 2614 *Ecklonis*; 3981, 4317 *pubescens*.
 HAFSTROM & ACOCKS. 422 *sarcophylla*; 423 *papulosa*; 721 *papulosa*; H1002 *secunda*; 2296 *papulosa*.
 HENDERSON. 11 *procumbens*.
 HENRICI. 25 *secunda*; 1898 *papulosa*; 2158 *africana*; 2610 *namaensis*; 2736 *sarcophylla*; 2890 *prostrata*; 3295 *africana*; 33, 35, 36 *fruticosa*; 4392 *procumbens*; 4503 *sarcophylla*; 4761 *sarcophylla*; 4768 *papulosa*; 9349 *procumbens*.
 HOBART-HAMPDEN. 23 *fallax*.
 HOWES. 187 *fruticosa*.
 HUTCHINSON. 574 *filiformis*; 717 *sarcophylla*; 3136 *papulosa*; 3136a *sarcophylla*.
 JOHNSON. 547 *sarcophylla*.
 KIES. 293 *procumbens*.
 KINGES. 2054 *fallax*; 2256 *pruinosa*; 2458 *sarcophylla*; 2462 *africana* v. *secundata*.
 KOTZE. 802 *procumbens*.
 LAMB. 3642 *crystallina*.
 LEIGHTON. 2411 *Dregeana*.
 LEIPOLDT. 912 *africana*; 4012 *hispidissima*.
 LETTY. 130 *crystallina*.
 LEVYNS. 424 *cymosa*; 1261 *fruticosa*; 1363 *pruinosa*; 2657 *cymosa*; 3162, 3476 *secunda*; 4182 *secunda*; 4321 *portulacacea*; 5156 *crystallina*; 5166 *filiformis*; 6687 *secunda*; 8016 *affinis*.
 LIEBENBERG. 4198 *fruticosa*; 4479 *africana*; 5105 *papulosa* v. *microphylla*.
 LINDSTEDT. 34 *pubescens*.

- LOEB. X1 *squamulosa*.
 MACOWAN. 445 *secunda*.
 MACPHERSON. 3698/14 *papulosa*.
 MAGUIRE. 135, 138 *crystallina*; 143 *fruticosa*; 211 *filiformis*; 528, 704 *secunda*; 754 *fruticosa*.
 MARAIS. 6 *filiformis*; 142 *pubescens*.
 MARLOTH. 702 *africana*; 976 *pubescens* v. *lignosa*; 1297 *papulosa*; 1532 *sarcophylla*; 3734 *africana*; 3701 *fruticosa*; 4316 *fallax*; 8247 *secunda*; 8583 *pubescens*; 8984 *africana*; 9813 *subcarnosa*.
 MICHELL. 262 *fruticosa*.
 MOGG. 3960 *pubescens* v. *lignosa*; 4764 *pubescens*; 8109 *pubescens* v. *lignosa*.
 MORAN. 36, 198 *pubescens*.
 MOSS. 2407 *herniariaefolia*; 6815 *africana*; 11559 *africana* x *namaensis*; 17487 *africana*; 17880 *fallax*; 17938 *namaensis*; 18039 *secunda*; 18014 *sarcophylla*.
 MUIR. 106 *secunda*; 597 *africana*; 1824 *herniariaefolia*; 2399, 2737 *secunda*; 3753 *cymosa*; 4709 *pubescens*.
 NANNI. 129 *secunda*.
 ORPEN. 12, 128 *filiformis*.
 PAGE. 115 *africana*; 41 *pubescens*.
 PARKER. 3630 *africana*.
 PATERSON. 3082 *filiformis*; 3232 *secunda*.
 PAXON. 127 *namaensis*.
 PEARSON. 514 *pruinosa*; 529 *sarcophylla*; 530 *papulosa*; 3074 *sarcophylla*; 3244, 3278 *africana*; 3356 *sarcophylla*; 3355 *squamulosa*; 4799, 4814 *africana*; 4855 *crystallina*; 5013, 5146 *africana*; 5317 *squamulosa*; 5448, 6027 *sarcophylla*; 6221 *fruticosa*; 7172 *hispidissima*; 8573, 8574, *sarcophylla*; 8575 *africana*; 9126 *sarcophylla*; 9228 *crystallina*; 9327 *namaensis*.
 PHILLIPS, E. P. 1637 *hemisphaerica*.
 PILLANS. 3278, 4952 *africana*; 4969 *collina*; 5013 *Dregeana*; 5158 *pruinosa*; 5198 *crystallina*; 5332 *pruinosa*; 5387 *Dregeana*; 5428 *namaensis*; 5529 *Dregeana*; 5550 *collina*; 5555 *crystallina*; 5595 *pruinosa*; 6464 *africana*; 18048 *collina*; 18049 *sarcophylla*; 18052 *fruticosa*; 18053 *collina*; 18054 *fruticosa*.
 POLE EVANS. 11 *secunda*; 20 *papulosa*; 51 *fruticosa*; 1881, 1882 *sarcophylla*; 2286 *sarcophylla*; 2335 *africana*; 2541 *secunda*; 19107H *africana*; H19334, H19374 *namaensis*.
 PONT. 320 *pubescens*.
 POTTS. 2830, 2363 *prostrata*.
 REHMANN. 2010, 2469 *africana*.
 REYNOLDS. 4186 *africana* v. *secundata*.
 RODIN. 1283 *secunda*; 2139 *namaensis*; 2781 *namaensis*; 3051 *rigida*.
 ROGERS. 200 *papulosa*; 205 *sarcophylla*; 2275, 2606, 3778 *pubescens*; 4268 *secunda*; 4466 *pubescens*; 12030 *secunda*; 12123 *pubescens*; 16532 *secunda*; 16803 *africana*; 17118 *papulosa*; 17164 *pubescens*; 17796 *secunda*; 26953 *secunda*; 27366 *pubescens*; 29520 *papulosa*; 29768 *squamulosa*.
 SALTER. 4900 *Ecklonis*; 6397 *secunda*; 7012 *fruticosa* v. *prostrata*; 7678 *secunda*; 8621, 8783 *pubescens*.
 SCHLECHTER. 31 *africana*; 34 *africana* & *collina* v. *Meziana* & *papulosa*; 38 *papulosa* & *sarcophylla*; 285 *africana*; 1817 *secunda*; 2616 *secunda*; 5632 *africana*; 5719 *pubescens*; 8103 *crystallina*; 8107 *crystallina*; 8157, 8159 *collina*; 8312 *secunda*; 8313 *crystallina*; 9481 *herniariaefolia*; 11065 *squamulosa*; 11216 *collina*; 11240 *crystallina*; 11279 *pruinosa*; 11290 *crystallina*; 11301 *africana* v. *pentandra*; 11327 *sarcophylla*; 11441 *pruinosa*.
 SCHINZ. 916 *sarcophylla*.
 SCHMIDT. 397 *sarcophylla*.
 SCHONLAND. 180 *pubescens*.
 SCULLY. 258 *crystallina*.
 SHAW. 50 *procumbens*.
 SIDEY. 342 *procumbens*; 403 *namaensis*.
 SIEBER. 164 *herniariaefolia*; 351 *africana*; 2132 *secunda*.
 SIM. 2664 *secunda*; Galpin 5976 *prostrata*; Galpin 5977 *procumbens*; Galpin 5978 *prostrata*.

- SMITH, C. A. 483, 485 *sarcophylla*; 3516 *secunda*; 3694 *pubescens*; 4592 *prostrata*; 4593, 4596 *namaensis*; 4599, 4603, 4607 *prostrata*; 4623A *namaensis*; 5174 *procumbens*; 5393, 5437 *namaensis*.
- STEPHENS. 7172 *hispidissima*; 7260 *africana*.
- STEPHENS & GLOVER. 8762 *fruticosa*.
- STEYN. 9864 *namaensis*.
- STOKOE. 9223 *africana*.
- STORY. 1119 *africana*; 1299, 1300 *secunda*; 2878 *portulacacea*.
- TAYLOR, L. E. 907 *subcarnosa*; 1104 *crystallina*; 1126 *collina*; 2734 *sarcophylla*.
- THERON. 87 *procumbens*; 89 *africana*; 221 *sarcophylla*; 533 *namaensis*; 850 *secunda*; 906 *fruticosa*; 1150 *procumbens*; 1622 *africana*.
- THODE. A571 *secunda*; A572 *papulosa*; A665 *pubescens*; A1895 *africana*; A1896 *crystallina*; A1897 *papulosa*; A2663 *pubescens*.
- TYSON. 12 *secunda*; 28 *papulosa*; 146 *procumbens*; 254 *procumbens*; 429 *secunda*; 431 *sarcophylla*; 763 *africana*; 1033 *pubescens*. 2322 *Ecklonis*; 2925 *filiformis*; 4001 *africana*.
- VAN BREDA. 112 *crystallina*; 316 *portulacacea*.
- VAN NIEKERK. 330 *squamulosa*; 344 *herniariaefolia*.
- VAN RENSBURG. 51062 *africana*.
- VERDOORN. 979 *prostrata*; 1034 *sarcophylla*; 1082 *procumbens*; 1325 *sarcophylla*; 1522, 1605 *procumbens*.
- WAGENER. 146 *sarcophylla*.
- WASSERFALL. 1037 *sarcophylla*; 1143 *africana* v. *secundata*.
- WEBB. 5, 11 *sarcophylla*.
- WEBB & BRANDWYCK. 1479 *africana*.
- WELWITSCH. 1092, 1093 *africana* v. *pentandra*.
- WILMAN. 427 *namaensis*; 3417 *exigua*.
- WOLLEY-DOD. 2062, 2168 *herniariaefolia*; 3127, *crystallina* v. *maritima*.
- WISS. 965 *sarcophylla*.
- ZEYHER. 3, 188 *pubescens*; 189 *secunda*; 719 *sarcophylla*; 722 *collina*; 723 *fruticosa*; 724 *affinis*; 1049 *pubescens* v. *pallens*; 2132 *secunda*; 2135 *pubescens*; 2134 *secunda*; 2632 *secunda*; 2633 *secunda*; 2635 *pubescens*; 2636 *pubescens* v. *pallens*; 2637 *filiformis*; 2638 *africana* & *pubescens*.